July 31, 2013

Collaborative Groundfish Essential Fish Habitat Proposal:

Protecting Groundfish Essential Fish Habitat While Balancing Fishing Opportunities in Monterey Bay National Marine Sanctuary, South of Año Nuevo

	
Rosy rockfish (*Sebastes rosaceus*)	Phylum *Porifera* and Class *Crinoidea*

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I. PROPOSAL

DATE OF PROPOSAL: July 31, 2013

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BACKGROUND

Designated in 1992, Monterey Bay National Marine Sanctuary (MBNMS) is a federally protected marine area offshore of California's central coast. Stretching from Marin to Cambria, the sanctuary encompasses a shoreline length of 276 miles and 6,094 square nautical miles of ocean, extending an average distance of 30 miles from shore. At its deepest point, the MBNMS reaches 12,713 feet (more than two miles). It is one of our nation's largest marine sanctuaries.

The habitats in the sanctuary harbor a variety of marine life, including 36 species of marine mammals, more than 180 species of seabirds and shorebirds, 525 species of fishes and an abundance of invertebrates and algae. The area supports commercial fisheries, including local fishermen from Half Moon Bay, Monterey Bay and Morro Bay.

On behalf of the collaborating organizations, MBNMS is submitting a proposal to the Pacific Fishery Management Council (PFMC) to modify boundaries for the Groundfish Essential Fish Habitat (EFH) 5-year Review Process. The proposal reflects a review of new information, and requests that the Council consider modifying the following suite of spatial management measures that were designed using the best available information for federal waters of MBNMS, south of Año Nuevo. The approach used for developing this proposal addresses the ongoing requirement to minimize to the extent practicable adverse impacts of fishing on EFH, and requests the following:

1. Spatial modifications to EFH designations that restrict bottom trawl gear by a) adding additional area to existing EFH Conservation Areas; b) proposing new EFH Conservation Areas designations; c) proposing new designations of Habitat Areas of Particular Concern (HAPC) "Areas of Interest"; and d) proposing re-opening of certain areas from existing EFH Conservation Areas to allow access to key historically bottom trawled areas of economic importance (see Table 1);
2. Voluntary management areas - non regulatory areas that are adopted by fishermen as no bottom trawl zones as a pilot project to be evaluated and monitored by the sanctuary to determine their effectiveness;
3. Changes to enforcement of spatial areas. This would include requiring the use of hydraulic sensors, changing VMS pings from 1 hour to 15 minute intervals, and the use of electronic logbooks; and
4. Benthic research and monitoring to collect baseline visual data in the modified areas.

MBNMS has developed the parameters of a proposal based on the Groundfish EFH Review Phase I Report (September 2012), the EFH Synthesis Report (April 2013), and has provided additional information about the geology, biogenic habitat and groundfish located within the proposed areas. This

proposal was developed to be principally consistent with the Magnuson-Stevens Fishery Conservation and Management Act (MSA) requirements pertaining to EFH and the management measures and designations for EFH as outlined in the Councils Pacific Coast Groundfish Fishery Management Plan (FMP). In addition, the MSA allows NOAA to manage fishing-related threats to deep-sea corals and sponges in federal waters through FMPs developed in conjunction with the Regional Fishery Management Councils. The MSA was amended in 2007, requiring NOAA to establish the Deep Sea Coral Research and Technology Program and providing new discretionary authority to protect deep-sea coral and sponge areas from damage caused by fishing gear. The proposal is also consistent with strategies in the MBNMS management plan that address bottom trawling effects on benthic habitat, ecosystem monitoring, and fishing-related outreach.

Table 1: Summary of Modifications to EFH Conservation Area Boundaries

Area #	EFH Modification	Site Name	Total Area Added (sq st mi)	Total Area Removed (sq st mi)
1	add to EFH	Ascension and Año Nuevo Canyon Complex	19.52	
2	add to EFH	South of Davenport	6.25	
3	reopen EFH	Lower Portion of Cabrillo Canyon		17.22
4	add to EFH	Outer Soquel Canyon	6.20	
5	add to EFH	Southwest of Smooth Ridge	6.10	
6	reopen EFH	South of Mars Cable		0.93
7	reopen EFH	West of Carmel Canyon		9.17
8	add to EFH	West of Sobranes Point	24.22	
9	reopen EFH	East of Sur Ridge		27.25
10	add to EFH	Triangle South of Surveyors Knoll	9.34	
11	reopen EFH	Sur Canyon Slot Canyons		44.55
12	add to EFH	Point Sur Platform	10.79	
13	add to EFH	Between Partington Point and Lopez Point	74.25	
14	add to EFH	La Cruz Canyon Complex	8.89	
15	add to EFH	West of Piedras Blancas State Marine Conservation Area	2.95	

Area #	EFH Modification	Site Name	Total Area Added (sq st mi)	Total Area Removed (sq st mi)
		TOTAL	**168.51**	**99.14**

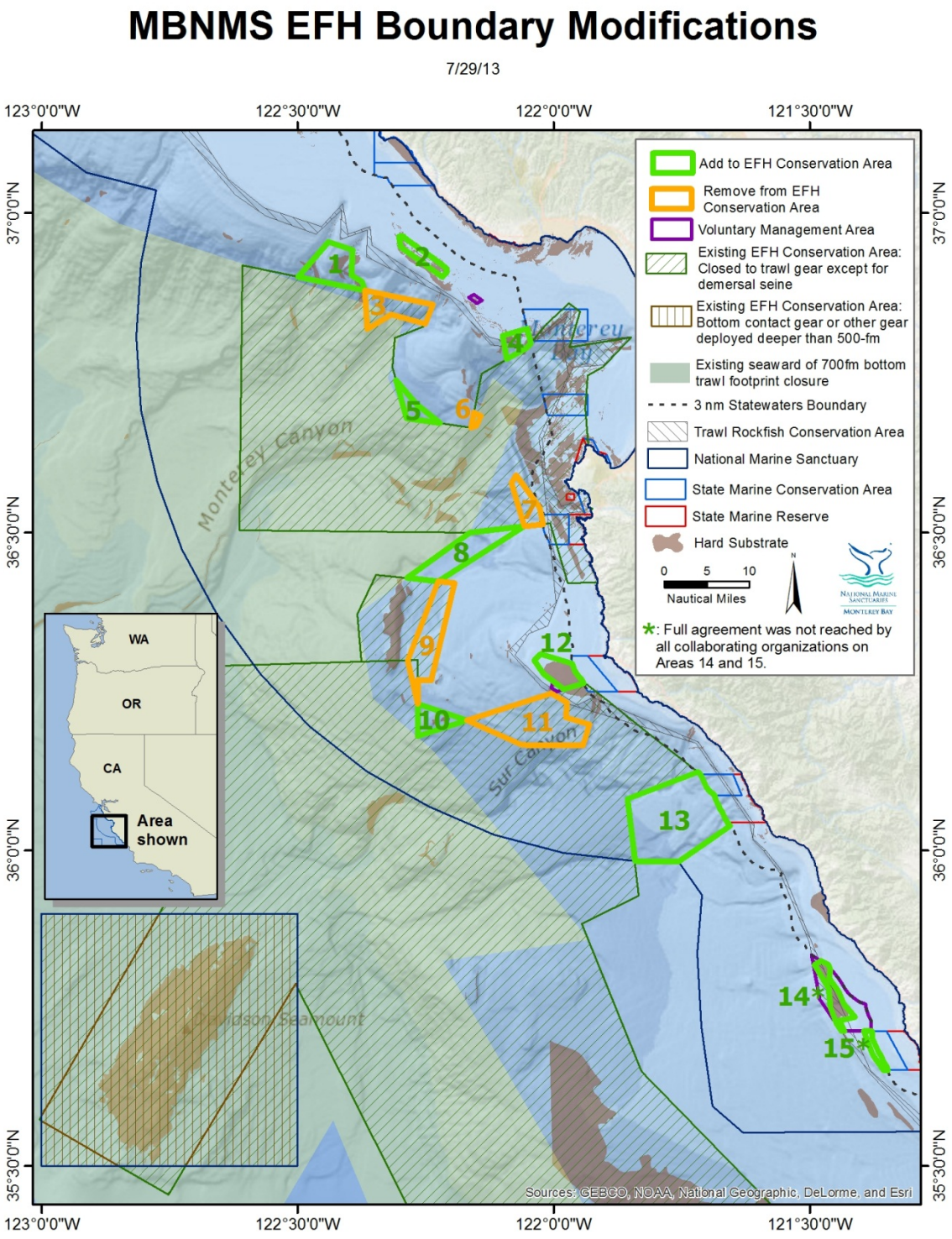


Figure 1: An overview map of all proposed EFH boundary modifications within the MBNMS study area, which is in Federal waters south of Año Nuevo and includes Davidson Seamount Management Zone

3a. Proposal Objectives:

This proposal represents the product of an eleven-month stakeholder process that began in August of 2012 with meetings among fishing industry stakeholders, and in June 2013 was expanded to include additional stakeholders, forming a group that represents MBNMS staff, MBNMS Advisory Council (SAC) representatives (Harbors and Commercial Fishing), Alliance of Communities for Sustainable Fisheries, Monterey Bay trawl fishermen, the City of Monterey, Oceana, Natural Resources Defense Council, Ocean Conservancy, The Nature Conservancy, the California Risk Pool and Environmental Defense Fund (see Appendix E).

- *Primary Goals:* To 1) identify and present information on habitat areas consistent with groundfish EFH within MBNMS that are currently not protected by EFH management measures that are unique, rare and/or ecologically sensitive either due to geologic features and/or contain known biogenic habitat (i.e. deep sea corals and sponges); and could be vulnerable to impacts of fishing activities managed by the Pacific Fishery Management Council; and 2) propose new EFH Habitat Areas of Particular Concern (HAPCs) and new Conservation Areas that minimize adverse fishing impacts to the extent practicable on groundfish EFH, and further the protection of both biogenic and physical habitat for Groundfish FMP species through prohibitions on bottom trawling; and 3) propose re-opening of certain sections of existing EFH Conservation Areas that will return valuable historical fishing grounds to the bottom trawl fleet. The overall goal of this proposal is to protect more total area and more sensitive habitats while improving fishing opportunities for the bottom trawl fleet relative to the current array of EFH Conservation Areas.
- *Objectives:*
    1. Present detailed, relevant data recently collected in the proposed areas that can assist the Council if they move forward with a proposed action; use as the basis for the proposal information summarized in the EFH Phase 1 report and the EFH Synthesis report.
    2. Propose Council consider designation of EFH Habitat Areas of Particular Concern (HAPC) "Areas of Interest" at Pt. Sur Platform and La Cruz Canyon.
    3. Propose protection of groundfish EFH, to the extent practicable, from bottom trawl gear at modified and newly proposed EFH Conservation Areas.
    4. Propose modifications of existing EFH Conservation Areas that re-open select areas to allow fishermen access to valuable, historic bottom trawl fishing grounds, while minimizing adverse impacts to groundfish EFH.
    5. Identify other measures that enhance protection and compliance

The approach for all stakeholder meetings was to work together using a scientific framework combined with local knowledge to develop a collaborative proposal for modifying EFH boundaries that considered both increased protection for groundfish EFH with opportunities for fishermen to access valuable fishing grounds. Combining scientific information on fishing grounds and benthic habitat with local fishing knowledge presents opportunities to discuss and discover goals for groundfish EFH shared by sanctuary managers, fishermen, scientists, and the conservation community. MBNMS recently completed a new management tool that identifies high value and/or sensitive benthic habitat - Sanctuary Ecologically Significant Areas (SESAs) (see Appendix D). The SESAs served as the basis for the sanctuary's initial areas of interest in discussions with fishermen and environmental groups. Some of the criteria in

developing SESAs have overlap with groundfish EFH criteria, and thus MBNMS was interested in looking for opportunities for enhanced conservation of groundfish EFH that overlapped with sanctuary goals for enhanced benthic habitat protection. . The trawl fleet was interested in exploring opportunities to re-open valuable fishing grounds that prohibit bottom trawl gear in EFH designations from 2006. The conservation community developed their own areas of interest based on high value habitat assessments as well as identifying areas that were lightly trawled or not trawled at all. All three stakeholder groups had ideas for proposed changes to EFH boundary modifications and saw opportunities for collaboration on the dual goals of increasing habitat protections and enhancing healthy and sustainable fishing practices. Lastly, an important guiding principle for the stakeholder meetings emerged, which was to build a collaborative relationship and trust between the sanctuary, fishermen and the conservation community through this process.

For purposes of this EFH proposal, the MBNMS Study Area was established as: 1) Federal waters only, 2) Region south of Año Nuevo, and 3) Including Davidson Seamount Management Zone. The region north of Año Nuevo is managed by the Gulf of the Farallones National Marine Sanctuary (GFNMS). GFNMS implements the MBNMS regulations for all activities except water quality in this region. GFNMS is not submitting a proposal for this area at this time, but is interested in reviewing any proposals for EFH area modifications or HAPC designations in this region.

A decision was made early on to focus on modifications to EFH measures that regulated bottom trawling only, such as EFH Conservation Areas that prohibit bottom trawl gear and the 700 fathom Footprint Closure. These limited discussions to use of bottom trawl gear only, and therefore did not address other bottom contact gear use. Use of bottom tending gear in sensitive habitats can have adverse impacts, but this is not always the case (e.g., National Research Council 2002; Lindholm et al. 2013). The 2008 MBNMS Management Plan includes an action plan "Bottom Trawling Effects on Benthic Habitat." which has the goal to maintain the natural biological communities and ecological processes in MBNMS by evaluating and minimizing adverse impacts of bottom trawling in benthic habitats while allowing the long-term continuation of sustainable local fisheries in the sanctuary. The collaborative EFH proposal addresses several of the specific strategies in the action plan, including: develop partnerships with fishermen; assess trawl activity; identify habitats vulnerable to trawling; and, identify and implement potential ecosystem protection measures.

Throughout the proposal development process, clear and transparent communication was employed to facilitate collaborative decision-making. Each member of the group had input on the proposed modifications to EFH Conservation Areas and the sanctuary technical team supported the process with spatial mapping products and tools, data analyses and interpretation (e.g., www.sanctuarysimon.org/maps/sesa).

The proposed boundary modifications of Areas 1 through-13 described in Figure 1 are a result of the collaborative stakeholder process, and represent a package of areas that if taken collectively provide increased protection to rocky reef HAPCs and sensitive biogenic species, including corals and sponges, as well as provide increased access to valuable fishing grounds. The package includes a total of 15 areas,

comprising ten additions to EFH Conservation Areas that add 168.5 square statute miles of benthic habitat that prohibit bottom trawl gear, and five modifications to existing EFH Conservation Areas that prohibit bottom trawl gear that re-open 99.1 square statute miles of benthic habitat to bottom trawling.

All parties achieved consensus on areas 1 through 13, however, two of the areas in the sanctuary (14 and 15 in region South of 36 degrees N) were negotiated without the participation of Oceana, Ocean Conservancy, and Natural Resources Defense Council. At the end of the stakeholder process, MBNMS finalized the design of these two areas with the California Risk Pool as the full group did not have the time or opportunity to reach consensus on these areas.

In addition, this proposal identifies and proposes two "voluntary management areas" that will not be affected by EFH regulation, yet will be recognized as areas to be avoided by trawlers due to sensitive habitat. One additional voluntary area is included in the vicinity of areas 14 and 15, which was developed by MBNMS and fishing stakeholders and again was not approved by all stakeholders. These areas have specific latitude and longitude coordinates that can be plotted by navigational software so that the fishermen can detect and avoid the areas. The details on how long the voluntary measures will be in place, and the timescale for revisiting the agreement will be worked out by the group in the next 2-3 months. These areas are non-regulatory, will be managed and monitored by the sanctuary, and should be considered as experimental or as pilot areas to test the effectiveness of the concept of voluntary management areas for habitat protection.

In summary, the array of proposed modifications to EFH designations will demonstrate a net habitat benefit to groundfish EFH, by:

- Further minimizing adverse impacts of bottom trawl fishing to groundfish EFH to the extent practicable, based on new and newly-available information.
- providing socioeconomic benefits at both the fishery and community scale
- increasing access of bottom trawl fishing activity to historically productive trawl fishing grounds in MBNMS that currently prohibit bottom trawl activity, while minimizing adverse impacts to EFH groundfish on a whole. The re-opening comes in the context of an overall package of revisions that will yield a strong net increase in habitat protection.
- increasing the overall protection of rocky reef (HAPC) and other hard substrate, biogenic habitats (e.g., corals, sponges, and other), canyon habitat, as well as soft substrate habitat, at various depths (see Table 2)

Table 2: Summary Statistics for Area, Habitat and Biogenic Observations

Proposed Modifications	Total Area (sq st mi)	Area of Habitat Type (sq st mi)		Proportion of Habitat Type		# Biogenic Observations (DSCRPT database)		
		hard bottom	soft bottom	hard bottom	soft bottom	Corals	Pennatulids	Sponges
Additions to EFH	168.51	27.34	141.17	16.2%	83.8%	1292	1443	3854
Re-opening EFH	99.14	0.36	98.78	0.4%	99.6%	2	12	0
Net Change	**69.37**	**26.98**	**42.39**	**39%**	**61%**	**1290**	**1430**	**3854**

3B. CONSISTENCY WITH COUNCIL RESPONSIBILITY

The proposal provides information that the Council can use to better account for the function of Pacific Coast Groundfish Essential Fish Habitat (EFH) when making fishery management decisions. The Council is responsible for minimizing adverse effects to the extent practicable from fishing on groundfish EFH and, within that broader definition, to protect habitat areas of particular concern, which the proposed options are designed to accomplish. The Council is also responsible for reviewing the best available science to determine whether protection of a particular area is warranted and assessing the potential socio-economic effects on the fisheries that may be affected by any proposal; these items are also taken into account by the proposal to be consistent with the Council's goals, objectives and guidelines.

Information presented is consistent with the January 2002 National Marine Fisheries Service (NMFS) rule that established guidelines to assist the Regional Fishery Management Councils and the Secretary of Commerce in the description and identification of EFH in fishery management plans, the identification of adverse effects to EFH, and the identification of actions required to conserve and enhance EFH.

The proposal is consistent MSA, the principal statutory basis for fishery management within the Exclusive Economic Zone.

The primary source of data utilized in this proposal comes from the EFH Phase 1 Report and the Groundfish EFH Synthesis Report. We also included additional new data from the Monterey Bay Aquarium Research Institute's (MBARI) Video Annotation and Reference System (VARS) database, and some groundfish and biogenic data from the California State University Monterey Bay's 2007-2012 Deepwater Characterization Remotely Operated Vessel (ROV) surveys, which is a partnership project between MBNMS and CSUMB's Institute for Applied Marine Ecology (See Appendix C). This proposal

also utilizes local knowledge and information from fishermen that is at a more refined scale than the data provided in the EFH Phase I Report and NMFS Synthesis, due to confidentiality of data.

3C. OVERVIEW OF NEW INFORMATION

The primary source of new information utilized in this proposal comes from the Groundfish EFH Phase 1 Report and Synthesis Report. Specifically, we have used:

- improved data on the location of rocky reef (HAPC) and the distribution of seafloor habitat types both inside and outside of EFH Conservation Area.
- the DSCRTP database of observations of corals, sponges and pennatulids, which represents a major advancement in availability of these records of coral and sponge presence in the region and that was not available during the Amendment 19 process.
- The newly available groundfish species habitat occurrence and abundance models for six species modeled by NWFSC and 12 species modeled by NCCOS.
- NMFS bottom trawl survey effort

We augmented the information presented in this proposal with site specific visual observation data of seafloor habitats in MBNMS when available. This additional new data includes (see Appendix C for more detailed information):

- observations from the Monterey Bay Aquarium Research Institute's (MBARI) Video Annotation and Reference System (VARS) database of 12 groundfish species in the MBNMS study area. The species were selected based on the species modeled by NWFSC and NCCOS and the observations were mapped and compared to the species habitat occurrence model predictions (see maps in Appendix #)
- visual observations of rocky habitat, biogenic habitat, and managed groundfish from the California State University Monterey Bay's 2007-2012 Deepwater Characterization surveys. These surveys are part of a partnership project between MBNMS and CSUMB's Institute for Applied Marine Ecology (IfAME & MBNMS 2011).

Lastly, this proposal also utilizes local knowledge and information from fishermen that is at a more refined scale than the data provided in the EFH Phase I Report and NMFS Synthesis Report, due to confidentiality of data. The trawl fishermen have provided very site specific 'socioeconomic' information on location of historically productive bottom trawl fishing grounds and operational logistics that aid in an economically viable fishery in the area. (See 5e in each area description).

Additional new information presented in the Phase 1 Report and EFH Synthesis Report, not summarized here, is covered in the Discussion section of this proposal.

4. PROPOSED ACTIONS

The following are proposed actions for Council consideration. The stakeholders request that the Council consider the proposed modifications as a comprehensive package, as the array of management measures was the end result of in-depth analysis and discussion between all stakeholders. The only exception to this request is that we offer options for designating two areas as HAPC "Areas of Interest".

4A. SPATIAL CHANGES

This proposal includes the following requests to modify or maintain the spatial designations of groundfish EFH provisions to minimize, to the extent practicable, the adverse effects of bottom trawl gear on groundfish EFH within:

ECOLOGICALLY IMPORTANT HABITAT CLOSED AREAS:

i. **EFH Conservation Area Expansions and New Designations:** Propose to expand seven EFH Conservation Areas(also known as ecologically important habitat closed areas) and designate three new EFH Conservation Area as follows: Area 1: expand the boundaries of the existing Monterey Bay/Canyon Conservation Area by adding the Ascension and Año Nuevo Canyon Complex; Area 2: propose designating South of Davenport a new EFH Conservation Area; Area 4: expand the boundaries of the existing Monterey Bay/Canyon Conservation Area by adding the Outer Soquel Canyon area; Area 5: expand the boundaries of the existing Monterey Bay/Canyon Conservation Area by adding an area southwest of Smooth Ridge; Area 8: expand the boundaries of the existing the Point Sur Deep Conservation Area by adding an area west of Sobranes Point; Area 10: expand the boundaries of the Big Sur Coast/Port San Luis Conservation Area by adding the area south of Surveyors Knoll ; Area 12: expand the northern portion of Big Sur Coast/Port San Luis Conservation Area by adding a portion of the Point Sur Platform; Area 13: expand the southern boundary of the Big Sur Coast/Port San Luis Conservation Area by adding an area between Partington Point and Lopez Point; Area 14: propose designating La Cruz Canyon a new EFH Conservation Area; and Area 15: propose designating West of Piedras Blancas SMCA a new EFH Conservation Area.

ii. **EFH Conservation Areas Re-openings:** Propose to eliminate 5 sections that are part of existing EFH Conservation Areas. The areas include: Area 3: re-open a section of Monterey Bay/Canyon Conservation Area near the Lower Portion of Cabrillo Canyon; Area 6: re-open a section of Monterey Bay/Canyon Conservation Area south of the MARS Cable; Area 7: re-open a section of Monterey Bay/Canyon Conservation Area west of Carmel Canyon; Area 9: re-open a section of Pt Sur Deep Conservation Area east of Sur Ridge; and Area 11: re-open a section of Big Sur Coast/Port San Luis Conservation Area near the Sur Canyon Slot Canyons.

iii. **Status Quo for Davidson Seamount:** Request no changes to the boundaries of the Davidson Seamount Conservation Area, which prohibits all bottom contact gear, or any other gear that is deployed deeper than 500 fathoms in the Davidson Seamount Management Zone of the MBNMS (Figure 3).

HAPC DESIGNATION OPTIONS: (Figure 2)

The proposed options are consistent with the MSA, the principal statutory basis for fishery management within the Exclusive Economic Zone. As per the MSA, habitat areas of particular concern (HAPC) are types of areas of habitat with EFH that are identified based on one or more of the following considerations: the importance of the ecological function provided by the habitat; the extent to which the habitat is sensitive to human-induced environmental degradation; whether, and to what extent development activities are or will be stressing the habitat type; and the rarity of the habitat type. The Groundfish FMP currently identifies the following habitat types as HAPC: estuaries, canopy kelp, seagrass, and rocky reefs. In addition the FMP identifies specific areas as HAPC, called "Areas of Interest", which are a variety of submarine features, such as banks, seamounts, and canyons. Two rocky banks, Point Sur Platform and La Cruz Canyon, have been delineated in MBNMS based on NMFS survey data and ROV observations of deep sea corals and sponges collected in 2007 to 2012. The Point Sur Platform rocky reef is based on United States Geological Survey (USGS) 2000 substrate data from acoustic imagery and the La Cruz Canyon rocky reef is based on Moss Landing Marine Labs seafloor mapping data from 2003 (geohab_ca in EFH catalog). MBNMS is proposing that these areas be added as "areas of interest" for HAPC designation, because they contain features and habitat types consistent with existing HAPC designations.

HAPC Option 1) Propose Council consideration of new EFH HAPCs "Areas of Interest" at Point Sur Platform (see Figure 2)

HAPC Option 2) Propose Council consideration of new EFH HAPCs "Areas of Interest" at La Cruz Canyon (See *Section 6-Discussion* for more information.) (see Figure 2)

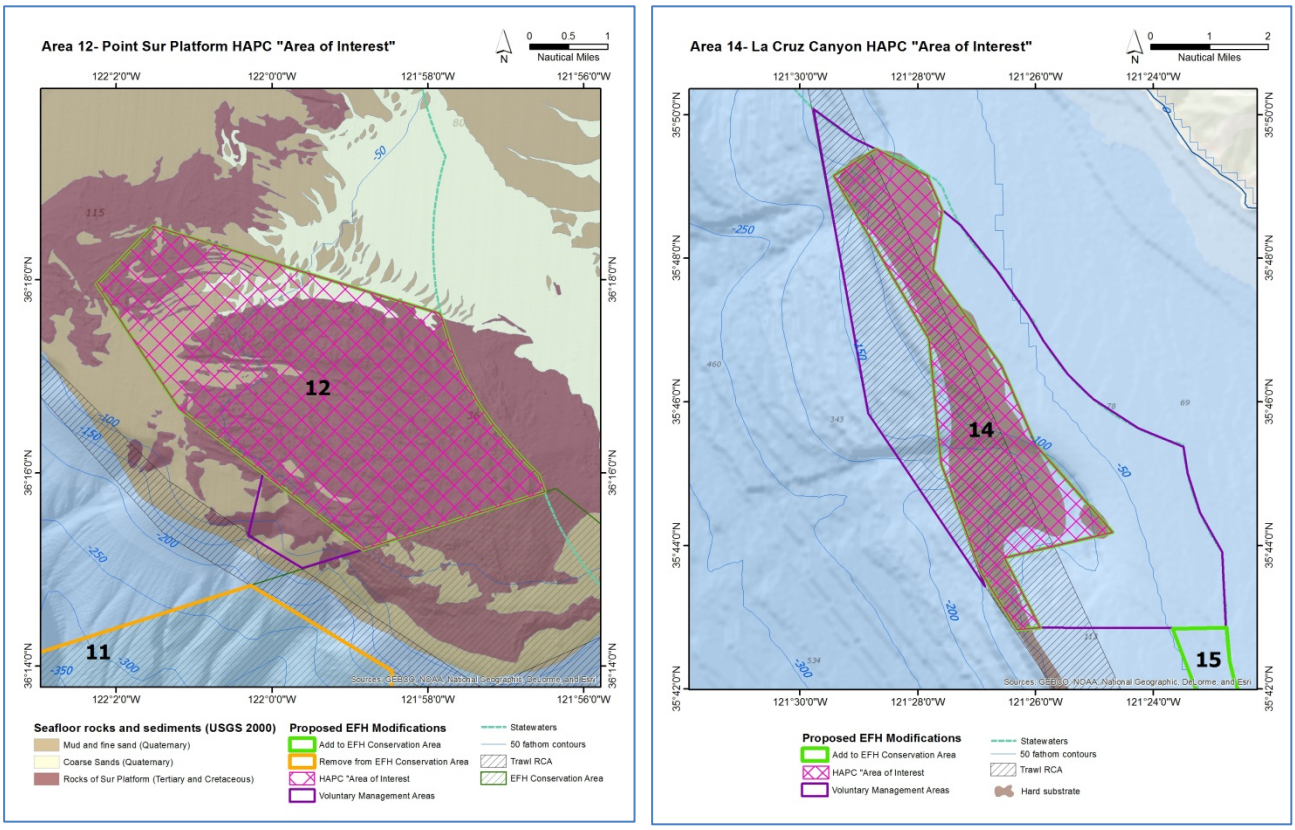


Figure 2: Proposed new HAPCs ¬at Point Sur Platform and La Cruz Canyon

4B. GEAR REGULATION CHANGES

i. Propose to prohibit bottom trawl gear (as defined in 50 CFR § 660.302) other than demersal seine in the newly proposed EFH Conservation Areas as described in 4a(i) of this proposal

ii. Propose to lift the restriction on bottom trawl gear (as defined in 50 CFR § 660.302) other than demersal seine, at those areas that are part of existing EFH Conservation Areas as described in 4a(ii) of this proposal.

4C. CHANGES TO THE DESCRIPTION AND IDENTIFICATION OF GROUNDFISH EFH AND ITS COMPONENTS.

As indicated above, the areas described in our proposal are proposed to be designated as EFH Conservation Areas, and designation of HAPC 'Areas of Interest' for Area 12, Pt. Sur Platform and Area 14, La Cruz Canyon.

4D. OTHER CHANGES

i. As a result of the collaborative nature of the stakeholder discussions, the group proposes a new spatial management concept - Voluntary Management Areas - which will be adopted by fishermen as voluntary no bottom trawl areas. Three areas are identified: South of Davenport Area 2, South of Pt Sur Platform Area 12 and East and West of La Cruz Canyon Area 14. These areas will be non-regulatory, and were developed as an experimental, pilot approach to test the effectiveness of this tool to protect small areas of important habitat where there is fishing community concern about small EFH areas that may be challenging to navigate.

ii. The group also proposed that as part of the revised EFH regulations, a new enforcement regime be implemented to include:

- Changing VMS ping rates from 1 hour to 15 minute intervals to more precisely indicate the location of the vessel track while fishing is occurring
- Requiring the use of hydraulic sensors to determine precisely when trawl nets are retrieved and deployed;
- Requiring depth sensors to record the active fishing depth of the trawl net in relation to the seafloor; and
- Requiring the recording and reporting of these sensory data by means of an electronic log book

5. Relevant and Applicable Characteristics Information

5a.b. & e. Biological, Geological & Socioeconomic Characteristics – All Areas Combined

This section looks at the proposal as a complete package and provides a summary of the biological, geological, and socioeconomic data for all proposed areas combined. The summary data demonstrates a net increase in conservation benefits for all benthic habitats (rocky habitat, canyon, and soft-bottom), biogenic organisms and groundfish, as well as an economic benefit for the local bottom trawl fishery.

Biological Characteristics (All Areas Combined)

Biogenic Components

There are a total number of 70,331 observations of corals, pennatulids, and sponges within the MBNMS study area in the DSCRPT database (Figure 3, Table 3). If we consider only corals and sponges (not including pennatulids) within the study area, 26,566 are inside current EFH conservation areas, leaving the remaining 9103 outside EFH conservation areas. **This proposal includes an additional 5146 observations of corals and sponges in new or expanded groundfish EFH Conservation Areas** (Table 3).

Table 3: Number of observations of corals, pennatulids (sea pens) and sponges in the DSCRPT database in the MBNMS study areas. Also provided are the number of observations that are inside and outside the boundaries of the current EFH Bottom Trawl Conservation Areas based on proposed changes.

Taxonomic Group	Total Observations in MBNMS Study Area	Status Quo		Proposed Changes		
		# Inside EFH Conservation Areas	# Outside EFH Conservation Areas	# Add to EFH	# Reopen Areas	Net Change
Corals	29641	25570	4071	**1292**	**2**	1290
Pennatulids	34662	11074	23588	**1443**	**12**	1431
Sponges	6028	996	5032	**3854**	**0**	3854
Grand Total	**70331**	**37640**	**32691**	**6589**	**14**	**+6575**

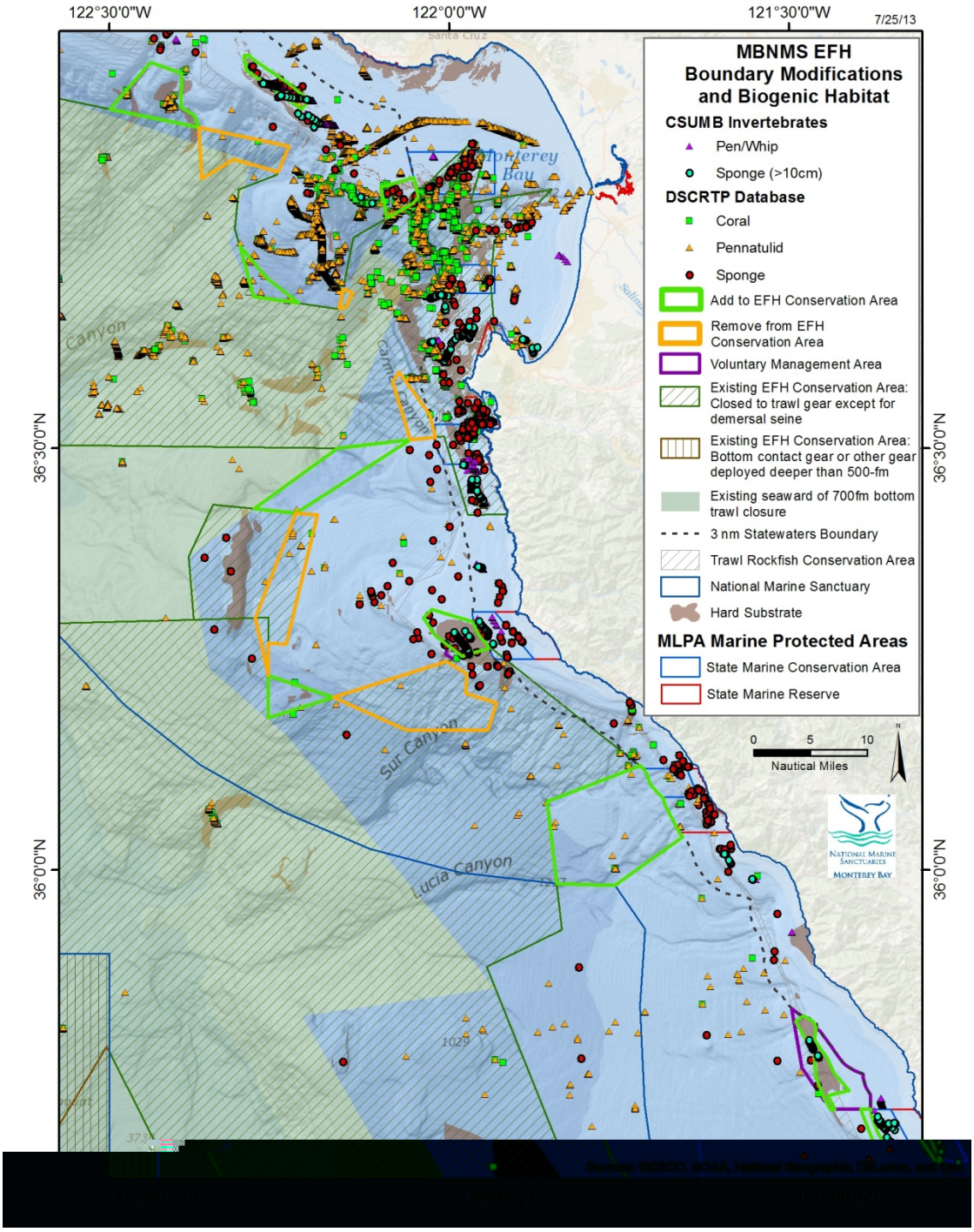


Figure 3: Location of observations of corals, sponges, and pennatulids from the DSCRTP database and CSUMB visual surveys in the MBNMS study area. See Appendix C for more information about CSUMB visual survey data.

In addition to the observations in the DSCRPT database, additional visual surveys by CSUMB in Areas 2, 12, and 14 indicates that the proposed actions would include an additional 636 sponge and 160 pennatulid observations **in new or expanded groundfish EFH Conservation Areas.** (Table 4).

Table 4: Number of observations of pennatulids (sea pens/sea whips) and sponges by CSUMB visual surveys in proposed areas 2, 12, and 14.

Taxonomic Group	Number Observations			
	Area 2	Area 12	Area 14	Total
Pennatulids	157	0	3	**160**
Sponges (>10 cm)	31	239	366	**636**
Total	**188**	**239**	**369**	**796**

Groundfish Components

Comparison of the maps of the NWFSC and NCCOS species habitat occurrence models with the locations of the 15 proposed areas (see maps in Appendix B) indicates that each of the 15 areas provide some amount of high suitability habitat for one or more of the six focal species. Using the output of the NWFSC models, we determined the number of high probability of occurrence cells that overlap with each of the proposed area for each of the focal species (Table 5).

Based on this analysis, some areas with a high probability of occurrence of the focal species are being proposed for re-opening to the bottom trawl fishery, particularly areas highly suitable for sablefish and longspine thornyhead. These species are part of the deep slope groundfish complex that is targeted by the commercial trawl fleet and the trawl fishermen indicated that those areas would be important to their economic sustainability.

However, for each focal species more cells with a high probability of occurrence are proposed for inclusion in new or expanded groundfish EFH bottom trawl conservation areas. In addition, in-situ observations by MBARI and CSUMB of the groundfish species included in the NWFSC and NCCOS models indicate that many species of groundfish have been observed in many of the areas proposed for addition to EFH Conservation Areas (Table 6). It is important to note that survey effort was highly variable in the areas shown in Table 6and the observations provide information on presence, but not absence or relative abundance of groundfish in the areas. Very little survey effort took place in the areas proposed for removal from EFH Conservation Areas.

Table 5: Number of high probability of occurrence cells from NWFSC species habitat occurrence models in proposed areas. The high probability of occurrence threshold for the three abundant focal species (sablefish, longspine thornyhead and Petrale sole) was set at a probability of occurrence ≥0.25. These thresholds are based on EFH Synthesis Report although it acknowledges that the cutoff is a subjective exercise (p.42). The counts represent part or all of a cell within the focal area. (*=count of 2by2km cell ≥0.50, **=count of 2by2km cell ≥0.25). Green font indicates areas proposed for addition and orange font.

	Number of High Probability of Occurrence Cells															Total # Add to EHF	Total # Reopen EFH	Net Change
	Area 1	Area 2	Area 3	Area 4	Area 5	Area 6	Area 7	Area 8	Area 9	Area 10	Area 11	Area 12	Area 13	Area 14	Area 15			
# possible cells	26	13	22	9	11	4	15	31	34	17	46	15	67	18	7	214	121	
Groundfish																		
Sablefish (ANFI)*	26	0	22	6	3	4	15	31	34	17	45	0	67	9	2	161	120	**+41**
Longspine Thornyhead (SEAL)*	23	0	22	5	3	4	15	31	34	17	42	0	67	0	0	146	117	**+29**
Petrale Sole (EOJO)*	0	13	0	3	0	0	0	0	0	0	2	15	0	13	7	51	2	**+49**
Yelloweye Rockfish (SERU)**	0	2	0	4	0	0	0	0	0	0	0	0	0	0	0	6	0	**+6**
Greenstriped Rockfish (SEEL)**	2	13	0	4	0	0	0	0	0	0	4	10	0	14	3	46	4	**+42**
Darkblotched Rockfish (SECR)**	0	0	0	0	0	0	0	0	0	0	2	0	0	6	2	8	2	**+6**

Table 6: In situ groundfish observations by ROV and camera sled in proposed areas (MBARI and CSUMB data). Note: there was a very small amount of survey effort within Area 7, but no observations of the species listed below were indicated in Area 7 and no effort was indicated in any of the other proposed areas.

Scientific Name	Common Name	Number Observations								
		Area 1	Area 2	Area 4	Area 5	Area 12	Area 13	Area 14	Area 15	Total
Anoplopoma fimbria	Sablefish	7		190			2			**199**
Eopsetta jordani	Petrale Sole			2						**2**
Microstomus pacificus	Dover Sole	16		82						**98**
Ophiodon elongatus	Lingcod		4	20		126		23	1	**174**
Sebastes crameri	Darkblotched Rockfish			3						**3**
Sebastes elongatus	Greenstriped Rockfish		4	60				3		**67**
Sebastolobus spp.	Thornyhead	260		1338	7		126			**1731**
Sebastolobus altivelis	Longspine thornyhead	36		146						**182**
Sebastes ruberrimus	Yelloweye Rockfish							1		**1**
Sebastes pinniger	Canary Rockfish			18						**18**
Canary/Vermilion/Yelloweye complex	Canary/Vermilion/Yelloweye complex		3	25		36		70	61	**195**
Young of Year (YOY)	Rockfish <5cm (usually in a school)		30	297		3047		488	67	**3929**
Sebastes paucispinis	Boccacio					8		3	1	**12**

SPATIAL AND GEOLOGICAL CHARACTERISTICS (ALL AREAS COMBINED)

The MBNMS study area includes 3,993 sq st miles. Based on the substrate data layers in the EFH Phase 1 Report (shown in Figure 4), 93.2% of the MBNMS study area is soft bottom and 6.8% is rocky habitat (Table 7). Currently, a total of 2,661 sq st miles are included in a combination of EFH Conservation Areas and the EFH 700 fm Trawl footprint closure. Given the changes to EFH Bottom Trawl Conservation Areas in this proposal - the addition of 168.51 sq st miles in 10 areas and the elimination of 99.14 sq st miles in five areas – that total area of would increase to 2,729.9 sq st miles. **This is a net addition of 69.37 sq st miles, of which 27.0 sq st miles is rocky habitat (an HAPC) (Table 2).**

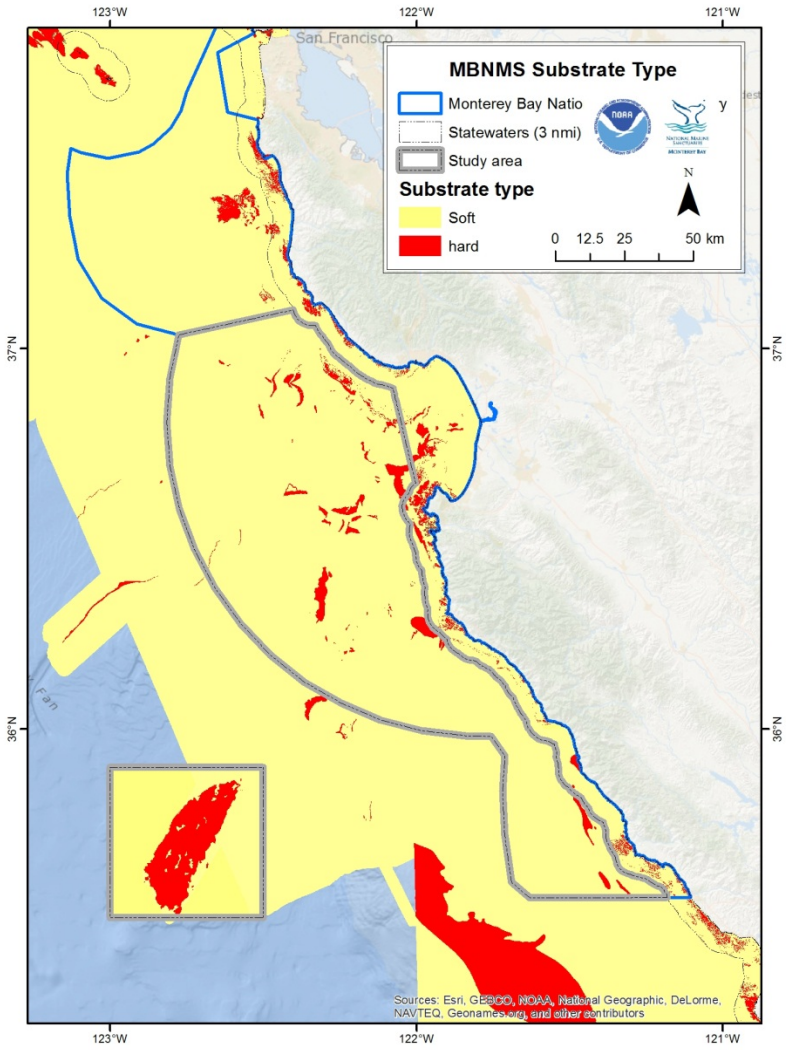


Figure 4: Substrate type in and around MBNMS.

Table 7: Hard and soft substrate within MBNMS study area (SA).

Substrate	Area of MBNMS SA (sq statute mi)	Percentage of MBNMS SA
hard	274.6	6.8%
Soft	3719.7	93.2%
Grand Total	**3993.3**	**100%**

Based on video observations at Pt. Sur Platform, the amount of hard bottom may be underestimated in some places by the NMFS data layer (see USCG 2000 data discussed in Appendix C). Thus the area of 27 sq st miles is likely a minimum estimate of rocky habitat proposed for inclusion in new or expanded EFH Conservation Areas. Also, note that only a very small amount of approximated hard bottom, 0.28 and 0.08 sq st miles within Areas 3 and 11, is inside areas proposed for re-opening to the groundfish bottom trawl fishery (Table 2 and Table 8).

Table 8: The total area encompassed by each of the areas proposed for addition or removal (grey filled rows) from groundfish EFH bottom trawl conservation areas. Area of hard and soft bottom habitat, as well as the proportion of the area by habitat type, is also provided.

Proposed Area	Total Area (sq st mi)	Area (sq st mi)		Proportion of Area	
		Hard Bottom	Soft Bottom	Hard Bottom	Soft Bottom
1	19.52	5.39	14.13	27.6%	72.4%
2	6.25	3.32	2.93	53.1%	46.9%
3	17.22	0.28	16.94	1.6%	98.4%
4	6.20	2.41	3.79	38.9%	61.1%
5	6.10	0	6.10	0%	100%
6	0.93	0	0.93	0%	100%
7	9.17	0	9.17	0%	100%
8	24.22	0	24.22	0%	100%

Proposed Area	Total Area (sq st mi)	Area (sq st mi)		Proportion of Area	
		Hard Bottom	Soft Bottom	Hard Bottom	Soft Bottom
9	27.25	0	27.25	0%	100%
10	9.34	0.77	8.58	8.2%	91.8%
11	44.55	0.08	44.47	0.2%	99.8%
12	10.79	8.05	2.74	74.6%	25.4%
13	74.25	0	74.25	0%	100%
14	8.89	7.40	1.49	83.2%	16.8%
15	2.95	0	2.95	0%	100%

This proposal aims to increase the amount of canyon habitats in MBNMS that is protected from bottom trawling. We have identified 44.5 sq st miles for inclusion in EFH Conservation Areas, 20% of which is hard bottom canyon habitat (Table 9). We have identified 24.2 sq st miles of canyon habitat to re-open for the groundfish bottom trawl fishery, comprised almost entirely of soft bottom canyon habitat (0.3 sq st miles of hard bottom canyon habitat). The net outcome of the proposal is a net increase in the amount of canyon habitat in EFH Bottom Trawl Conservation Areas of 20.3 sq st miles (Table 9).

Table 9: Total area (square statute miles) by habitat type (depth zone, substrate, canyon) for each type of proposed EFH modification For the SESA process, we developed a finescale subdivision of depth zone and this table shows the breakdown by depth for the different habitats.

Habitat Category (MBNMS SESA habitat categories)			Area (sq st mi)	
Depth Zones	Substrate Type	Canyon	Add to EFH CAs	Re-open EFH CAs
Shelf (30 - 100 m)	Hard bottom	No	10.4	0
	Soft bottom	No	5.9	0
Shelf Break (100 - 300 m)	Hard bottom	No	6.9	0

Habitat Category (MBNMS SESA habitat categories)			Area (sq st mi)	
Depth Zones	**Substrate Type**	**Canyon**	**Add to EFH CAs**	**Re-open EFH CAs**
		Yes	2.3	0
	Soft bottom	No	4.6	0.01
		Yes	1.0	0
Slope 1 (300 - 800 m)	Hard bottom	No	0.02	0.08
		Yes	2.2	0
	Soft bottom	No	20.1	22
		Yes	10.2	5.3
Slope 2 (800 - 3000 m)	Hard bottom	No	0.8	0
		Yes	4.5	0.3
	Soft bottom	No	74.5	52.7
		Yes	24.4	18.7

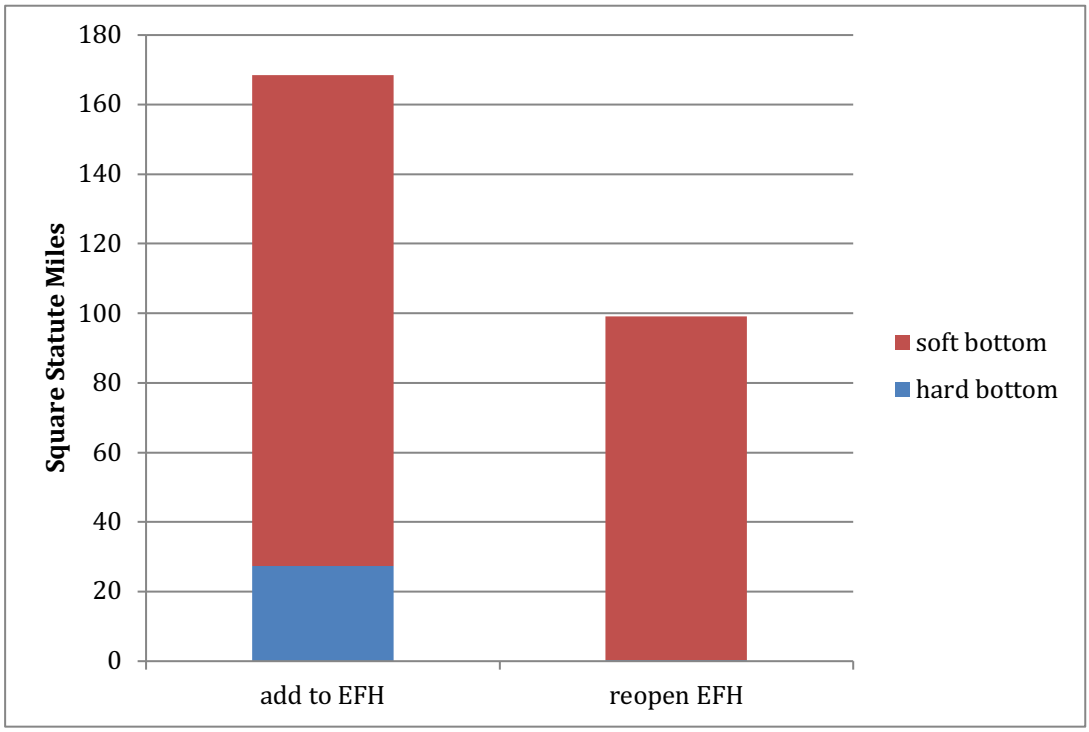


Figure 5: Area of hard bottom and soft bottom added and removed from existing EFH CAs.

5C.D. PHYSICAL OCEANOGRAPHIC AND CHEMICAL CHARACTERISTICS (ALL AREAS COMBINED)

Information on the physical oceanographic and chemical characteristics is incorporated by reference to the EFH Synthesis Report. In summary, the oceanographic and chemical characteristics in the proposed areas are consistent with the Central Biogeographic Region.

5E. SOCIOECONOMIC CHARACTERISTICS (ALL AREAS COMBINED)

Fishing a part of the Central coast's region history, culture and economy. With more than 500 commercial vessels and numerous recreational fishers, fishing in the region annually takes about 200 species, with the bulk of the commercial landings composed of squid, rockfishes, salmon, albacore, Dover sole, sablefish, mackerel, anchovy, and sardines. The five primary gear types used are pots and traps, trawl nets, hook-and-line gear, purse seines, and gill nets. In 2007, 560 fishing vessels made commercial landings at the five main ports in or adjacent to the Monterey Bay National Marine Sanctuary: Princeton/Half Moon Bay, Santa Cruz, Moss Landing, Monterey, or Morro Bay (CDFW).

The only fishery that may be affected by this proposal is the groundfish trawl fishery. One of the most important aspects about the development of this proposal is the high level of involvement and input the groundfish trawl fleet had on the designs to add or remove areas from EFH Conservation Areas. The

stakeholder group included five active trawl fishermen, the commercial fishing representatives from the Monterey Bay Sanctuary Advisory Council, and a coalition of groups that form the California Risk Pool (The Nature Conservancy, Fort Bragg Groundfish Association, Half Moon Bay Groundfish Marketing Association, and Central California Seafood Marketing Association). In addition, MBNMS staff met with trawl fishermen in Fort Bragg that had historically fished in the Sanctuary, and with fishermen Half Moon Bay who currently fish in the region of Año Nuevo. All of the fishermen's input and comments were considered as the area designs moved forward. The trawl fishermen were able to provide specifics on the location of trawl tows based on their navigational records, and detail on the trawl paths, which are normally curved to follow a particular contour line and avoid high relief geologic features or "snags". The group also discussed the current state of the trawl fleet, which has steadily declined in numbers to less than a dozen in California, with approximately five actively operating in the MBNMS.

If this proposal is accepted, a total of 99 square statute miles will be re-opened to the commercial groundfish trawl fleet, and the specific areas are key to providing a diverse portfolio of species both seasonally and geographically. The areas to be re-opened are economically important to the fishermen, and represent historically fished areas that are key to providing sustainable, viable trawl fisheries in the Monterey Bay Sanctuary. Some of the areas such as the Pt Sur Region were developed as a package and the proximity to Monterey Harbor makes these accessible and economically viable for the Monterey trawl fleet. Other areas such as Davenport are also highly productive fishing grounds as well and can be accessed from any port in Monterey Bay, as well as Half Moon Bay port. Approximately, 3.7% of all existing EFH Conservation areas are proposed to be re-opened, which is a relatively small percentage, and yet the areas are important for sustaining the five active trawlers in the MBNMS.

It's important to note that the group developed some additional management measures to help mitigate additional pressures on Industry. Please see the discussion section on Voluntary Management Areas and Changes to Enforcement of Spatial Areas for more information.

Lastly, we understand that as part of the Council's National Environmental Policy Act process in Phase Three, any fishery related socioeconomic impacts will be looked at through that comprehensive analysis.

5A.B.E., BIOLOGICAL, GEOLOGICAL & SOCIOECONOMIC CHARACTERISTICS BY AREA

The biological, geological and socioeconomic characteristics will be described in each the 15 proposed areas, from 1 to 15. It includes photos of featured habitat in each area (if available), a summary of the spatial and geologic characteristics, observed biogenic habitat and groundfish observations, as well as a description of any affects to fishing as relayed by the trawl fishermen. Maps for each of the spatial areas can be found in Appendix A with respective coordinates for latitude and longitude in Appendix E.

AREA 1 - EXPANSION OF THE MONTEREY BAY/CANYON CONSERVATION AREA TO INCLUDE THE AÑO NUEVO AND ASCENSION CANYON COMPLEX

	
Año Nuevo Ascension Canyon Complex; Image from July 2013 CSUMB cruise	Bubblegum coral (*Paragorgia*) in lower left; Image from 2008 MBARI cruise

5a. Biological Characteristics

Biogenic Components

A small portion of the seafloor in Año Nuevo Canyon and Ascension Canyon has been surveyed by an MBARI ROV (Appendix A, Area 1). The DSCRTP database contains 161 observations of hard-substrate associated corals - including bamboo, bubblegum, and mushroom soft corals - and 105 observations of soft-bottom associated sea pens and sea whips from these ROV surveys (Table 10). CSUMB just completed a 2013 deep water characterization cruise in July, and the summary data is not yet available, yet some images are available such as the sponge shown above left. Prohibiting bottom trawling in this area would protect these biogenic species that are highly vulnerable to, and slow to recover from, impacts from bottom trawling.

Table 10: Area 1: Observed Corals & Pennatulids (DSCRPT database).

Ascension and Año Nuevo canyon Complex	Common Name	Group	Count
Alcyonacea	Soft coral	Soft coral	1
Anthomastus ritteri	Mushroom soft coral	Soft Coral	16
Euplexaura sp.	Soft coral	Soft coral	3
Funiculina sp.	Sea Pen	Octocorals	27
Isididae	Bamboo coral	Octocorals	106
Paragorgia sp.	Bubblegum coral	Soft Coral	30
Pennatulacea	Sea Pen or Whip	Octocorals	32
Swiftia sp.	Soft coral	Soft coral	5
Umbellula lindahli	Sea Pen	Octocorals	46
Grand Total			**266**

Groundfish Components

The high habitat diversity in Area 1 provides habitat for a diversity of managed groundfish species. The NWFSC occurrence models predict that Area 1 contains high probability habitat for 3 species: sablefish, longspine thornyhead, and a small area of high probability habitat in the northern part of Area 1 for greenstriped rockfish (Table 5; for Figures see Appendix B).Consistent with these model predictions, sablefish and thornyhead had been observed during ROV surveys in Area 1 (Table 11). Dover sole have also been observed in this area (Table 11) by MBARI, which is consistent with the predictions of the NCCOS occurrence model of high probability of Dover sole in Area 1.

Table 11: Area 1: MBARI groundfish observations (VARS data query by Linda Kuhnz 7/18/13)

		Area 1
Scientific Name	**Common Name**	**Ascension and Año Nuevo canyon complex**
Anoplopoma fimbria	Sablefish	7
Microstomus pacificus	Dover Sole	16
Sebastolobus	Longspine and Shortspine Thornyhead guild	260
Sebastolobus altivelis	Longspine Thornyhead	36
Grand Total		**319**

5b. Spatial and Geological Characteristics

The proposed area extends the northern boundary of the EFH Monterey Canyon Area of Interest to include an additional 19.52 sq st miles of the Año Nuevo and Ascension Canyon complex (Appendix A, Area 1). Area 1 has high habitat richness (6 habitat categories) and diversity (H' = 4.05) due to a mix of hard and soft substrate and a wide depth range (322-1600 m) inside and outside of submarine canyons. Hard substrate, located primarily along the canyon walls, is approximated to cover 27.6% of Area 1 (Table 8). Adding Area 1 to the EFH bottom trawl closed areas would increase protection of hard substrate by 5.39 sq st miles (Table 7). This area is also included into SESA 4, which was identified by the Sanctuary as a location of unique, rare, or important benthic habitat.

5e. Socioeconomic Characteristics

Area 1 is an area of relatively low historic and current trawling activity and due to the abundance of rocky reef HAPC and biogenic habitat vulnerable to impacts from trawling, the fishing representatives agreed that this area should be protected through inclusion into an EFH conservation area. Current trawling operations in this region focus mainly on the shelf, specifically the seaward and shoreward sides of the Trawl Rockfish Conservation Area (RCA) where they target petrale sole, English sole and black cod (sablefish). Scottish seine is used on the upper northwest corner of the canyon. The canyon heads provide a widow rockfish fishery, which is an important fishery to the trawlers as this is one of only two areas within reach from Monterey Harbor where they have a high probability of catching this important species. The design of the Area 1 modifications considers, to the extent practicable to groundfish EFH, high value areas to the fishermen.

AREA 2 – ADD NEW CONSERVATION AREA – "SOUTH OF DAVENPORT"

	
Brittle stars near low lying rock outcrops	Mushroom soft corals (*Anthomastus ritteri*) on the right

5a. Biological Characteristics

Biogenic Components

Area 2 has been surveyed by NMFS (Appendix A). The DSCRTP database contains 39 observations of hard-substrate associated corals, 362 sponges, and 1061 observations of soft-bottom associated pennatulids in from these ROV surveys (Table 12). In 2008, CSUMB completed several transect through the middle and southern part of area 2 and observed 157 soft bottom associated seapens/whips and 31 sponges greater than 10 cm (Table 12). Brachiopod beds have also been observed in this area. Surveys to characterize benthic habitats and communities (using camera sled, submersibles, and ROVs) have occurred on the shelf and shelf break (see SIMoN webpage).

Table 12: Area 2: Observed Corals, Sponges & Pennatulids (DSCRPT database).

South of Davenport	Common Name	Group	Count
Anthozoa	Coral	Coral	39
Pennatulacea	Sea Pen or Whip	Octocorals	1061
Porifera	Sponge	Sponge	362
Grand Total			**1462**

Table 13: Area 2: CSUMB Observed Invertebrates (2007-2012)

South of Davenport	Common Name	Group	Count
Pennatulacea	Sea Pen or Whip	Octocorals	157
Porifera	Sponge (>10 cm)	Sponge (>10 cm)	31
Grand Total			**188**

Groundfish Components

The NWFSC occurrence models predict that Area 2 contains high probability habitat for 4 species: petrale sole, yelloweye and greenstriped rockfish (Table 5). The high probability habitat for abundant focal species (petrale sole) was selected as the probability of occurrence ≥0.50 and high probability of occurrence for less abundant focal species (yelloweye and greenstriped) was identified as the probability of occurrence ≥0.25 (based on cutoffs in EFH Synthesis Report p.42.

Table 14: Area 2: CSUMB Groundfish Observations 2007-2012

		Area2
Scientific Name	**Common Name**	***South of Davenport***
Canary/Vermilion/Yelloweye complex	Canary/Vermilion/Yelloweye complex	3
Sebastes elongatus	Greenstriped Rockfish	4
Ophiodon elongatus	Lingcod	4
Young of Year (YOY)	Rockfish <5cm (usually in a school)	30
Grand Total		**41**

Area 2 overlaps substantially with the survey area of a recent study, which estimated the relative abundance of habitats on the shelf (65-110 m) and examined demersal fish species composition, diversity, density, and sizes relative to these habitats (Laidig et al. 2009). A total of 62 fish taxa were observed, including many groundfish FMP species. Different fish assemblages were found to characterize mud, boulder, and brachiopod habitats. An abundance of immature fishes were observed which may indicate that this area of the shelf is a nursery for younger fishes (see Section 6. Discussion for more information about potentially important juvenile habitat).

5b. Spatial and Geographical Characteristics

This area is proposed as an additional EFH Conservation Area that is located between the state water line and the RCA off South of Davenport, CA. It would add 6.25 sq st miles to EFH and is located on the shelf in a relatively shallow depth range (88-107 m). The area contains a mixture of hard (53%) and soft bottom on the outer shelf and shelf break off Davenport and the head of Cabrillo Canyon (south central portion). This area has a relatively low habitat richness (4 habitats) and habitat diversity (index = 1.0). This southern end of this area is included into SESA 5, which was identified by the Sanctuary as a location of unique, rare, or important habitat.

5e. Socioeconomic Characteristics

This is an active trawl fishing ground for fishermen in Monterey Bay and Half Moon Bay. However, this area as designed will not affect their key trawl paths. One trawl path is shoreward of the RCA and in-between the RCA and the main rocky reef feature that is captured in Area 2. The width is approximately 1.7 miles in this channel that will remain open and provide the shelf fishery needed to support the trawl fishery. Target groundfish species in this area are widow rockfish and additional shelf rockfish complex species on the seaward side. Another trawl path is on the shallower shoreward side of Area 2 and includes targets flatfish species such as dover sole and sanddab.

South of this proposed Area 2 is a small “voluntary management area” that was selected based on a small outcropping of hard substrate and the yelloweye rockfish occurrence model by NWFSC. Hundreds of pennatulids and many corals have been observed in this area from MBARI ROV dating back to 1993 and 2006. This area is not included in the EFH proposal as an EFH modification, yet based on the density of pennatulids and the location of the rocky reef, there is agreement by the fishermen to observe this as a no trawl zone.

AREA 3 –RE-OPEN AN AREA OF THE MONTEREY BAY/CANYON CONSERVATION AREA IN LOWER CABRILLO CANYON

5a. Biological Characteristics

Biogenic Components

West Coast Groundfish Bottom Trawl Surveys in or near this area have collected 1 specimen of hard-substrate associated coral, *Anthomastus ritteri* (mushroom soft coral), in 2008 and 1 soft-bottom associated pennatulid in 2001 (Table 15).

Table 15: Area 3: Observed Corals & Pennatulids (DSCRPT database).

Lower Portion of Cabrillo Canyon	Common Name	Group	Count
Anthomastus ritteri	Mushroom soft coral	Soft Coral	1
Pennatulacea	Sea Pen or Whip	Octocorals	1
Grand Total			**2**

Groundfish Components

Area 3 provides suitable habitat for the subset of managed groundfish species that are associated with soft bottom habitat on the slope and in canyons. For example, this area contains high probability habitat for sablefish and longspine thornyhead based on the NWFSC occurrence model.. The threshold of high probability habitat for abundant focal species, e.g. sablefish and longspine thornyhead was selected as the probability of occurrence $\geq$0.50 (based on cutoffs in EFH Synthesis Report p.42).

5b. Spatial and Geographical Characteristics

The proposed area alters the northern boundary of the EFH Monterey Canyon Area of Interest to remove 17.22 sq st miles over Cabrillo Canyon and the eastern wall of Año Nuevo Canyon. Area 3 contains slope habitat ranging in depth from 586 m to 1436 m. The seafloor in this area is approximated to be mostly soft sediment (98.4%). A small area of hard substrate (0.28 sq st miles) is located along the western wall of Cabrillo Canyon (Appendix A, Area 3).

5e. Socioeconomic Characteristics

This proposed area restores access to a historically trawled area that has been fished over multiple generations. This area provides a deep water complex fishery, which includes longspine and shortspine thornyhead rockfish, sable fish and dover sole. Trawl fishermen historically deployed their net in the

north along the south edge of Año Nuevo Canyon in Area 1 and conduct a long tow south that followed the 600 meter contour line down into Area 3. The tow would follow the contour line turning back north, and the fishermen would mid water trawl over the small hard substrate area in the canyon and continue east. Re-opening Area 3 will restore an important commercial fishing ground that was trawled quite intensively prior to the EFH designation. Also, this could be viewed as a corrective measure to more accurately reflect the seaward of 700 fathom bottom trawl footprint closure, as the true 700 fathom line dips down into the existing regulatory boundary due to trying to aid enforcement and providing a straight line of the boundary in this area. Lastly, the proximity to all three Monterey ports (Santa Cruz, Moss Landing, Monterey) as well as access from Half Moon Bay port makes this a preferred fishing ground for the existing fleet.

AREA 4 - EXPANSION OF THE MONTEREY BAY/CANYON CONSERVATION AREA TO INCLUDE AN AREA WEST OF SOQUEL CANYON

	
Brachiopod bed	Greenstriped rockfish *(Sebastes elongates)* and basket star (Order *Phrynophiurida)*

5a. Biological Characteristics

Biogenic Components

NMFS groundfish trawl surveys, MBARI and CSUMB ROV surveys to characterize benthic habitats and communities (using camera sled, submersibles, and ROVs) have occurred over hard and mixed substrate in the shelf and shelf break depth zones, and in canyon habitats (e.g., canyon head, wall, and floor). There are 2076 records of structure-forming invertebrates – soft corals and gorgonians, brachiopods, crinoids, stony corals, sponges, and chemosynthetic communities –from surveys.

Table 16: Area 4: Observed Corals, Sponges & Pennatulids (DSCRPT database)

Outer Soquel Canyon	Common Name	Group	Count
Alcyoniidae	Soft coral	Soft coral	1
Anthomastus ritteri	Mushroom soft coral	Soft Coral	56
Anthomastus sp.	Mushroom soft coral	Soft Coral	96
Anthozoa	Coral	Coral	104
Caryophylliidae	scleractinia	Stony Coral	40
Funiculina sp.	Sea Pen	Octocorals	6
Funiculina-Halipteris complex	Sea Pen or Whip	Octocorals	3
Halipteris californica	Sea Whip	Octocorals	2
Halipteris sp.	Sea Whip	Octocorals	1
Paragorgia sp.	Bubblegum coral	Soft Coral	1
Pennatulacea	Sea Pen or Whip	Octocorals	99

Pennatulidae	Sea Pen or Whip	Octocorals	39
Porifera	Sponge	Sponge	1593
Ptilosarcus gurneyi	Sea Pen	Octocorals	3
Ptilosarcus sp.	Sea Pen	Octocorals	1
Swiftia simplex	Soft coral	Soft coral	7
Umbellula lindahli	Sea Pen	Octocorals	19
Umbellula sp.	Sea Pen	Octocorals	1
Virgularia sp.	Sea Pen	Octocorals	1
Virgulariidae	Sea Pen	Octocorals	3
Grand Total			**2076**

This area is also included into SESA 6, which was identified by the Sanctuary as a location of unique, rare, or important habitat.

Groundfish Components

The NWFSC occurrence models predict that Area 4 contains high probability habitat for 5 species: sablefish, longspine thornyhead, petrale sole, yelloweye and greenstriped rockfish (Table 5). The threshold of high probability of occurrence for abundant focal species (sablefish, longspine thornyhead and petrale sole) was selected as the probability of occurrence $\geq$0.50 and for less abundant focal species (yelloweye and greenstriped) the threshold was identified as the probability of occurrence $\geq$0.25 (based on cutoffs in EFH Synthesis Report p.42

Table 17: Area 4: MBARI groundfish observations (VARS data query by Linda Kuhnz 7/18/13).

		Area 4

Scientific Name	Common Name	Outer Soquel Canyon
Anoplopoma fimbria	Sablefish	188
Eopsetta jordani	Petrale Sole	1
Microstomus pacificus	Dover Sole	82
Ophiodon elongatus	Lingcod	7
Sebastes crameri	Darkblotched Rockfish	3
Sebastes elongatus	Greenstriped Rockfish	2
Sebastolobus	Longspine and Shortspine Thornyhead guild	1338
Sebastolobus altivelis	Longspine Thornyhead	146
Grand Total		**1767**

The NWFSC occurrence models predict that Area 4 contains high probability habitat for 5 species: sablefish, longspine thornyhead, petrale sole, yelloweye and greenstriped rockfish (Table 5). The threshold of high probability of occurrence for abundant focal species (sablefish, longspine thornyhead and petrale sole) was selected as the probability of occurrence $\geq$0.50 and for less abundant focal species (yelloweye and greenstriped) the threshold was identified as the probability of occurrence $\geq$0.25 (based on cutoffs in EFH Synthesis Report p.42).

Table 18: Area 4: CSUMB groundfish observations (2007-2012).

		Area 4
Scientific Name	**Common Name**	**Outer Soquel Canyon**
Anoplopoma fimbria	Sablefish	2

Canary/Vermilion/Yelloweye complex	Canary/Vermilion/Yelloweye complex	25
Sebastes pinniger	Canary Rockfish	18
Sebastes elongatus	Greenstriped Rockfish	58
Eopsetta jordani	Petrale Sole	1
Ophiodon elongatus	Lingcod	13
Young of Year (YOY)	Rockfish <5cm (usually in a school)	297
Grand Total		**414**

5b. Spatial and Geographical Characteristics

Area 4 will add 6.20 sq st miles to the Monterey Bay Canyon EFH Conservation Area (Table 1). It covers a wide range of benthic habitats including a mix of hard (39%) and soft bottom in shelf, shelf break, and slope depth zones from 95 m to 1026 m. This proposed area includes the head of a small, unnamed canyon to the west of Soquel Canyon and a portion of the western wall of Monterey Canyon. This area has a high habitat diversity (H' = 6.62) and high habitat richness (10 habitats). The RCA bisects the middle of this proposed modification, and it is adjacent to the southeastern boundary of the Soquel Canyon SMCA.

5e. Socioeconomic Characteristics

This area currently has supports low level trawl activity, which was mitigated to the extent practicable with the design. This area is also in close proximity to several ports (Monterey, Moss Landing and Santa Cruz), and trawl fishermen currently use the areas north and east of the Area 4 boundaries to target shelf break species of rockfish and flat fish near the RCA. Since Area 4 does contain 39% hard bottom, they lay out their trawl net close to the east boundary and run further east. Alternately, they lay out north of the rocky area, and run along the shoreward side of the RCA. It's important to note for this area that the enforcement related changes (see Discussion section) are addressed and incorporated as part of this proposal process. The lack of "buffer" for the fishermen is of concern, especially in light of significant fines levied for crossing an EFH boundary.

AREA 5 - EXPANSION OF THE MONTEREY BAY/CANYON CONSERVATION AREA TO INCLUDE AN AREA SOUTHWEST OF SMOOTH RIDGE

	
Sea pen *(Pennatula phosphorea californica)* (MBARI/NOAA)	**Sea pig; crab; snail** *(Genus Scotoplanes; Family Lithodidae; Genus Neptunea)* (MBARI/NOAA)

5a.Biological Characteristics

Biogenic Components

Survey effort for biogenic habitat has been limited in this area (Appendix A, Area 5) The DSCRTP database contains 23 records of pennatulids observed in or collected from Area 5, including members of seven different genera (Table 19). Twenty records are from West Coast Groundfish Bottom Trawl Surveys in or around this area, seven records are from ROV video surveys, and 4 records are from collected specimen (Table 20).

Table 19: Area 5: Observed Pennatulids (DSCRPT database).

SW of Smooth Ridge	Common Name	Group	Count
Anthoptilum grandiflorum	Sea Pen	Octocorals	3
Anthoptilum sp.	Sea Pen	Octocorals	2
Funiculina sp.	Sea Pen	Octocorals	3
Halipteris sp.	Sea Whip	Octocorals	1
Pennatula californica	Sea Pen	Octocorals	4
Pennatula sp.	Sea Pen	Octocorals	1

Pennatulacea	Sea Pen or Whip	Octocorals	1
Stylatula sp.	Sea Pen	Octocorals	2
Umbellula sp.	Sea Pen	Octocorals	3
Virgularia sp.	Sea Pen	Octocorals	1
Virgulariidae	Sea Pen	Octocorals	2
Grand Total			**23**

Groundfish Components

The soft sediment slope habitat in this area provides suitable habitat for the subset of managed groundfish species that are associated with deeper soft bottom habitat. The NWFSC occurrence models predict that Area 5 contains high probability habitat for 2 species: sablefish and longspine thornyhead (Figure 5). The threshold of high probability of occurrence for abundant focal species (sablefish and longspine thornyhead) was selected as $\geq$0.50 (based on cutoffs in EFH Synthesis Report p.42). As mentioned above, survey effort in this area has been limited but fish from the longspine and shortspine thornyhead guild were observed by MBARI (Table 19).

Table 20: Area 5: MBARI groundfish observations (VARS data query by Linda Kuhnz 7/18/13).

		Area 5
Scientific Name	**Common Name**	**SW of Smooth Ridge**
Sebastolobus	Longspine and Shortspine Thornyhead guild	7
Grand Total		**7**

5b. Spatial and Geological Characteristics

The proposed area alters the northern boundary of the EFH Monterey Bay/Canyon Conservation Area to include an additional 6.10 sq st miles of slope habitat located on the deep southwest side of Smooth Ridge (Appendix A, Area 5). Area 5 contains soft slope habitat ranging in depth from 1149 m to 1304 m. No

known hard bottom habitat occurs in this area (Table 7). Area 5 overlaps with the northeast corner of SESA 9 Deep Monterey Canyon.

5e. Socioeconomic Characteristics

Area 5 is deeper than the traditional trawl path used in the past or currently. Historically, the tow followed the 650 m (355 fathom) contour, and so fishermen agree that adding this area into EFH will not interfere with that particular trawl path which will be enhanced by the proposed re-opening for Area 6. This is supported by the NMFS Fishing Effort data layer for bottom trawling for before and after.

AREA 6 – RE-OPEN AN AREA OF THE MONTEREY BAY/CANYON CONSERVATION AREA SOUTH OF THE MBARI'S MARS CABLE

Sea pig; crab; snail *(Genus Scotoplanes; Family Lithodidae; Genus Neptunea)* (MBARI/NOAA)

5a. Biological Characteristics

Biogenic Components

No structure-forming invertebrates have been observed or collected as bycatch from this area, however there has been little to no known survey effort in this small area.

Groundfish Components

The soft bottom habitat in Area 6 provides habitat for a diversity of managed groundfish species. The NWFSC occurrence models predict that Area 6 contains high probability habitat for sablefish and longspine thornyhead (Figure 5). High probability habitat for abundant focal species (sablefish and longspine thornyhead) was selected as the probability of occurrence $\geq$0.50 (based on cutoffs in EFH Synthesis Report p.42).

5b. Spatial and Geological Characteristics

The proposed area alters the northern boundary of the EFH Monterey Bay/Canyon Conservation Area to exclude 0.93 sq st miles of slope habitat located between Smooth Ridge and Monterey Canyon (Figure #). Area 6 contains soft slope habitat ranging in depth from 1067 m to 1211 m. No known hard bottom habitat occurs in this area.

5e. Socioeconomic Characteristics

This re-open area is linked to Area 5 (SW of Smooth Ridge) as it provides a small deep area for the trawl fishermen to complete their tow and turn northwest, after they complete the tow coming south and along

the north eastern border of the Smooth Ridge addition. Issues regarding enough space or "buffer" to complete a tow and retrieve the net completely were discussed as an enforcement concern to fishermen. The fishermen have expressed that a number of factors can affect control of a vessel beyond weather conditions (wind, swell, etc.) and can include mechanical situations such as engine failure, winch failure, and operator error. As a result, bottom trawl fishermen have concerns about committing a violation when they are fishing in close proximity to closed areas because they can drift into in to a closed area as a result of hanging their gear on a snag or loss of engine power. These issues are discussed in more detail in the Discussion section. In summary, this area is added "buffer" to reduce the probability of enforcement violations.

The following six areas (7,8,9,10,11 and 12) are referred to as the "Pt Sur Region" and were designed together as a region. The Pt Sur Region is a historic and vital fishing ground for the Monterey Bay trawl fleet. It also represents a crown jewel for the conservation community for diverse, biogenic habitat and associated fish species. The proximity to Monterey Port makes the region economically viable for the trawl fleet. Pt Sur Platform's unique geologic features include a deep water canyon complex, which creates highly productive fishing grounds. The package of 6 areas, taken together, is designed to achieve three goals: protect important groundfish EFH habitat (Area 12), provide improved access to fishing for the trawl fleet (Areas 7, 9, 11), and additions for non-trawled areas into EFH (Areas 8,10).

AREA 7 – RE-OPEN AN AREA OF THE MONTEREY BAY/CANYON CONSERVATION AREA WEST OF CARMEL CANYON

5a. Biological Characteristics

Biogenic Components

No known hard bottom habitat occurs in this area and no structure-forming invertebrates have been observed or collected as bycatch from this area, however there has been little to no survey effort in this area.

Groundfish Components

The soft sediment slope habitat in this area provides suitable habitat for the subset of managed groundfish species that are associated with soft bottom habitat. The NWFSC occurrence models predict that Area 7 contains high probability habitat for sablefish and longspine thornyhead (Table 5). High probability habitat for abundant focal species (sablefish and longspine thornyhead) was selected as the probability of occurrence $\geq$0.50 (based on cutoffs in EFH Synthesis Report p.42).

5b. Spatial and Geological Characteristics

The proposed Area 7 alters the southeast boundary of the EFH Monterey Canyon Area of Interest to exclude 9.17 sq st miles of slope habitat located between the north end of Point Lobos SMCA and a proposed addition west of Sobranes Point (Appendix A, Area 7). Area 7 contains slope 1 and 2 habitat ranging in depth from 459 m to 1175 m.

5e. Socioeconomic Characteristics

This area was historically trawled prior to the EFH designation in 2006. It provides an area close to Monterey port (approximately 12 miles) that allows fishermen to set their trawl net at the north end of the area and tow south along the 500 m (273 fathom) contour line. This is the start of a long, deep water tow that will follows the 500-600 meter contour line down along the eastern boundary of Point Sur Deep and Big Sur Coast/Port San Luis EFH Conservation Area. Target species in Area 7 are slope rockfish species. The addition of the species landed in this area help provide a diverse portfolio of species that will be more economically viable for the trawl fishermen.

AREA 8 – EXPAND THE POINT SUR DEEP CONSERVATION AREA NORTH TO INCLUDE AN AREA WEST OF SOBRANES POINT

5a. Biological Characteristics

Biogenic Components

No known hard bottom habitat occurs in this area. Only one structure-forming invertebrate - a soft-bottom associated pennatulid - has been observed or collected as bycatch from this area by the 2003 West Coast Groundfish Bottom Trawl survey, however there has been very little survey effort in this area (Appendix A, Area 8).

Table 21: Area 8: Observed Pennatulids (DSCRPT database).

W of Sobranes Point	Common Name	Group	Count
Pennatulacea	Sea Pen or Whip	Octocorals	1

The southwest portion of this area is also included into SESA 11, which was identified by the Sanctuary as a location of unique, rare, or important habitat.

Groundfish Components

The soft sediment slope habitat in this area provides suitable habitat for the subset of managed groundfish species that are associated with deeper soft bottom slope habitat. The NWFSC occurrence models predict that Area8 contains high probability habitat for sablefish and longspine thornyhead (Table 5). High probability habitat for abundant focal species (sablefish and longspine thornyhead) was selected as the probability of occurrence $\geq$0.50 (based on cutoffs in EFH Synthesis Report p.42).

5b. Spatial and Geological Characteristics

The proposed area is 24.22 sq st miles and shares boundaries on three sides with an existing EFH boundary: the EFH Monterey Bay/Canyon Conservation Area to the north; the 700 fathom trawl footprint to the west; and the Point Sur Deep and Big Sur Coast/Port San Luis EFH Conservation Area to the south (Appendix A, Area 8). Area 8 includes soft slope habitat ranging in depth from 929 m to 1602 m.

5e. Socioeconomic Data

Conservation stakeholders requested that we add Area 8 to EFH conservation areas as it is not currently trawled by fishermen because it is too deep. The boundary adjustment will extend Point Sur Deep Conservation Area Northeast and will not infringe on any fishing activities.

Fishermen will set their trawl net at the north end of the area west of Carmel and tow south along the 500 m (273 fathom) contour line. Area 8 is seaward of a long trawl path that will follow the 500-600 m contour line down along the eastern boundary of Point Sur Deep and Big Sur Coast/Port San Luis EFH Conservation Area, and as such does not impact trawling activities.

AREA 9 – RE-OPEN AN AREA EAST OF THE POINT SUR DEEP CONSERVATION AREA

5a. Biological Characteristics

Biogenic Components

West Coast Groundfish Bottom Trawl Surveys in or around this area have collected 10 soft-bottom associated pennatulid, including individuals from the Families Virgulariidae, Umbellulidae, and Anthoptilidae. The DSCRTP database contains 1 record of a gorgonian collected from this area.

Table 22: Area 9: Observed Corals, Sponges & Pennatulids (DSCRPT database).

E of Sur Ridge	Common Name	Group	Count
Anthoptilum grandiflorum	Sea Pen	Octocorals	4
Gorgonacea	Soft coral	Soft coral	1
Pennatulacea	Sea Pen	Octocorals	2
Stylatula sp.	Sea Pen	Octocorals	2

Umbellula sp.	Sea Pen	Octocorals	1
Virgulariidae	Sea Pen	Octocorals	1
Grand Total			**11**

Groundfish Components

The soft sediment slope habitat in this area provides suitable habitat for the subset of managed groundfish species that are associated with deeper soft bottom slope habitat. The NWFSC occurrence models predict that Area 9 contains high probability habitat for sablefish and longspine thornyhead (Table 5). High probability habitat for abundant focal species (sablefish and longspine thornyhead) was selected as the probability of occurrence $\geq$0.50 (based on cutoffs in EFH Synthesis Report p.42).

5b. Spatial and Geological Characteristics

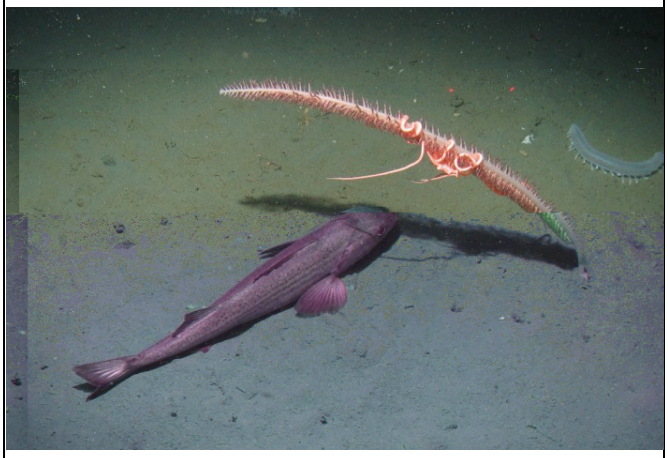
The proposed area alters the eastern boundary of Point Sur Deep and Big Sur Coast/Port San Luis EFH Conservation Area to exclude 27.25 sq st miles of slope habitat located to the east of Sur Ridge (Appendix A, Area 9). Area 9 contains soft slope habitat ranging in depth from 924 m to 1233 m. No known hard bottom habitat occurs in this area.

5e. Socioeconomic Characteristics

This proposed area moves the eastern boundary of Point Sur Deep and Big Sur Coast/Port San Luis EFH Conservation Area EFH even further east. Fishermen historically deployed their net in the north and ran a long tow that will follows the 600 m contour line down along the Sur Ridge geologic feature, as well as seaward of the feature. Moving the EFH boundary east will provide space to follow the contour line in one sweeping trawl path from west of Carmel Canyon, down along east of Sur Ridge and south into the Sur Canyon complex.

Target species in Area 9 are primarily flat fish species. The addition of the species landed in this area help provide a diverse portfolio of species that will be economically more viable for the trawl fishermen.

Area 10 – Expand the Big Sur Coast/Port San Luis Conservation Area by Adding a Small Area South of Surveyors Knoll



2013 CSUMB Cruise: Sablefish & Sea Whip

5a. Biological Characteristics

Biogenic Components

According to the Distribution of Coral and Sponge Standardized Survey Catch (After) this area has a medium to low level of bycatch when the data area considered on a local scale of the MBNMS (based on NMFS's GIS layer of the Distribution of Corals and Sponges off the U.S. West Coast from Standardized Survey Catch (2006-10) from Task 1).

Table 23: Area 10: Observed Pennatulids (DSCRPT database).

Triangle S of Surveyors Knoll	Common Name	Group	Count
Pennatulacea	Sea Pen or Whip	Octocorals	1

Groundfish Components

The NWFSC occurrence models predict that Area 10 contains high probability habitat for sablefish and longspine thornyhead (Table 5). High probability habitat for abundant focal species (sablefish and longspine thornyhead) was selected as the probability of occurrence $\geq$0.50 (based on cutoffs in EFH Synthesis Report p.42).

5b. Spatial and Geological Characteristics

Area 10 is 9.34 sq st miles and shares boundaries on two sides with the Big Sur Coast/Port San Luis EFH Conservation Area. It also connects to Area 9 on the northeast tip and Area 11 on the southwest tip

(Appendix A, Area 10). Area 10 includes hard slope habitat ranging in depth from 1027 m to 1155 m. 92% soft bottom habitat occurs in this area, and it has a low habitat diversity (index = 1.33). The southwest area of Area 8 overlaps with the Sur Ridge SESA 11.

5e. Socioeconomic Characteristics
The area as designed should not impact trawling activities.

AREA 11 –RE-OPEN A NORTHERN SECTION OF BIG SUR COAST/PORT SAN LUIS CONSERVATION AREA NEAR THE SUR CANYON SLOT CANYONS

Photo: Widow rockfish from 2004 Delta Sub survey at Pt Sur

5a. Biological Characteristics

Biogenic Component
West Coast Groundfish Bottom Trawl Surveys between in or around this area have observed 1 sea pen.

Table 24: Area 11: Observed Pennatulids (DSCRPT database).

Sur Canyon Slot Canyons	Common Name	Group	Count
Anthoptilum grandiflorum	Sea Pen	Octocorals	1

Groundfish Component
The soft sediment slope habitat in this area provides suitable habitat for the subset of managed groundfish species that are associated with deeper soft bottom habitat. For example, the NWFSC occurrence models predict that Area 11 contains high probability habitat for 5 species: sablefish, longspine thornyhead, and a small area of high probability habitat in the NE part of Area 11 for greenstriped rockfish, darkblotched

rockfish and petrale sole (Table 5). High probability habitat for abundant focal species (sablefish, petrale sole and longspine thornyhead) was selected as the probability of occurrence ≥0.50 and high quality for less abundant focal species (greenstriped and darkblotched rockfish) was identified as the probability of occurrence ≥0.25 (based on cutoffs in EFH Synthesis Report p.42).

5b. Spatial and Geological Characteristics

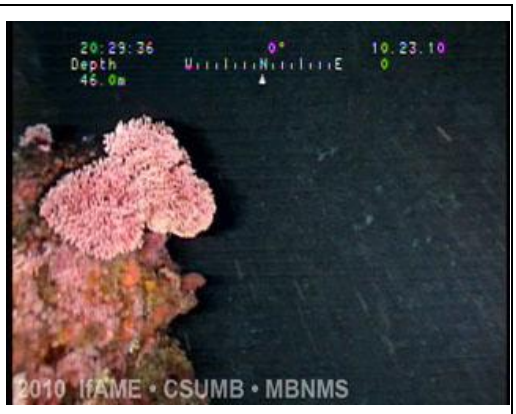
The proposed area alters the northeast boundary of Big Sur Coast/Port San Luis EFH Conservation Area to exclude 44.55 sq st miles of slope habitat located to the southeast of Point Sur Platform (Appendix A, Area 11). Area 11 contains soft slope habitat ranging in depth from 153 m to 598 m. 0.2% of known hard bottom habitat occurs in this area.

5e. Socioeconomic Characteristics

This proposed area restores access to a historically trawled area that has been fished over multiple family generations. This area provides two primary fisheries: Deepwater complex and shelf rockfish assemblages. Fishermen historically deployed their net in the north and ran a long tow that follows the 500 m contour line down along the Sur Ridge geologic feature, and south into Area 11. Providing the depth contour to 500 m, will provide the deep water fishery complex which is connected to this long tow south. In addition, there is a shallower tow in the northeast region of Area 11 that supplies a commercially important target species to the trawlers - widow rockfish. This is one of two main fishing grounds in the MBNMS that supply this species.

The addition of the species landed in this area help provide a diverse portfolio of species that will be economically more viable for the trawl fishermen.

AREA 12 – EXPAND THE NORTHERN BOUNDARY OF THE BIG SUR COAST/PORT SAN LUIS CONSERVATION AREA TO INCLUDE A SECTION OF THE POINT SUR PLATFORM (ALSO ADD AS A NEW HAPC AREA OF INTEREST)

	
Sponges at northwest corner of Pt. Sur Area	Pink branching hydrocoral (*Stylaster norvigicus*)

5a. Biological Characteristics

Biogenic Components

The DSCRTP database contains 19 observations corals and sponges from Area 12. These observations include 780 corals, 1899 sponges and 12 sea pens (Table 25). In addition, in Area 12 a total of 10 transects have been surveyed by ROV/camera sled by a collaborative research program between CSUMB and MBNMS (Appendix A, Area 12). These surveys have recorded an additional 92 select observations in both still images and video format. Following is an example of the available videos for this area.

This video shows the geological characteristics of the area:
http://www.youtube.com/watch?v=isWCEHVPy9k

This video shows some of the rockfish assemblages:
http://www.youtube.com/watch?v=-5jYdns0-gs

Table 25: Area 12: Observations from DSCRTP database.

Pt Sur Platform Rocks	Common Name	Group	Count
Anthozoa	Coral	Coral	780
Pennatulacea	Sea Pen or Whip	Octocorals	12
Porifera	Sponge	Sponge	1899
Grand Total			**2691**

Table 26: Area 12: CSUMB Observed Invertebrates (2007-2012).

South of Davenport	Common Name	Group	Count
Porifera	Sponge (>10 cm)	Sponge (>10 cm)	239
Grand Total			**239**

Prohibiting bottom trawling in this area would protect these biogenic species that are highly vulnerable to, and slow to recover from, impacts from bottom trawling.

Groundfish Components

The rocky outer shelf habitat in Area 12 provides habitat for a diversity of managed groundfish species. Area 12 has been extensively surveyed by ROV and camera sled by a collaborative research program between CSUMB and MBNMS and many types of rockfish have been observed (Table 26 and 27 and Appendix A, Area 12). The NWFSC occurrence models predict that Area 12 contains high probability habitat for 2 species: petrale sole and greenstriped rockfish (Table 5). High probability habitat for abundant focal species (petrale sole) was selected as the probability of occurrence $\geq$0.50 and high quality for less abundant focal species (greenstriped rockfish) was identified as the probability of occurrence $\geq$0.25 (based on cutoffs in EFH Synthesis Report p.42).

Table 27: Area 12: CSUMB Groundfish observations (2007-2012).

		Area 12
Scientific Name	**Common Name**	***Sur Platform Rocks***
Canary/Vermilion/Yelloweye complex	Canary/Vermilion/Yelloweye complex	36
Ophiodon elongatus	Lingcod	126
Sebastes paucispinis	Boccacio	8
Young of Year (YOY)	Rockfish <5cm (usually in a school)	3047
Grand Total		**3217**

Table 28: Area 12: CSUMB Groundfish observations with Camera Sled (2006).

		Area 12
Scientific Name	**Common Name**	***Sur Platform Rocks***
Ophiodon elongatus	Lingcod	1
Canary/Vermilion/Yelloweye complex	Canary/Vermilion/Yelloweye complex	6
Sebastes paucispinis	Boccacio	7
	Widow Rockfish	1
	Cowcod	1

	Pygmy Rockfish	9
	Starry Rockfish	4
Grand Total		**28**

Through the CSUMB IfAME partnership, the following video on groundfish is available for this area: http://www.youtube.com/watch?v=MwqLZnJEReM

5b. Spatial and Geological Characteristics

The proposed area covers 10.79 sq st miles on the Sur Platform west of the Point Sur State Marine Conservation Area (Appendix A, Area 12). The proposed area includes hard and soft bottom habitat on the shelf between 51m and 112 m. Based on the NMFS benthic substrate data layer, hard substrate is approximated to cover 74.6% of Area 12 (Table 7). However, benthic habitat surveys completed in the north west portion of Area 12 indicate that hard substrate is under-represented in this data layer. Thus, adding Area 12 to the EFH bottom trawl closed areas would protect more than 8.05 square st miles of hard substrate HAPC. This area is also included into SESA 12, which was identified by the Sanctuary as a location of unique, rare, or important habitat.

5e. Socioeconomic Characteristics

The group spent some extended time on this Area 12 in order to ensure it does not negatively impact the trawl fishery. The proposed area is too rocky to trawl, and therefore does not impact groundfish trawl fisheries. However, the area just outside can be trawled in a southward approach. The trawl fishermen set nets just north on the Sur Platform, so we designed the modification to avoid presenting a "buffer" issue meaning not enough room for the fishermen to set their nets and turn to continue a tow without entering Area 12. It's important to note for this area that the enforcement related changes (see discussion section) are addressed and incorporated as part of this proposal process. The lack of "buffer" for the fishermen is of concern, especially in light of significant fines levied for crossing an EFH boundary.

The group also designated a small "voluntary management area" that extends the southeast boundary (between Area 12 and the RCA) and was selected to include a small extension of rocky reef based at the head of Pt Sur Canyon. The area is not included in the EFH proposal as an addition, yet based on the rocky reef HAPC, and the number of observation of structure forming inverts in this area, there is agreement by the fishermen to observe this as a no trawl zone.

AREA 13 – EXPAND THE SOUTHERN BOUNDARY OF THE BIG SUR COAST/PORT SAN LUIS CONSERVATION AREA TO INCLUDE AN AREA BETWEEN PARTINGTON POINT AND LOPEZ POINT

	
Umbellula magniflora	Sea pen of the Genus *Funiculina*

5a. Biological Characteristics

Biogenic Component

There are 68 records of structure-forming invertebrates including soft corals (Alcyoncea species) and gorgoneans, (sea pens) from ROV surveys and groundfish trawl surveys. Sampling effort has been limited due to distance from ports.

Table 29: Area 13: Observed Corals, Sponges & Pennatulids (DSCRPT database).

	Common Name	**Group**	**Count**
Between Partington Point and Lopez Point			
Anthomastus ritteri	Mushroom soft coral	Soft Coral	7
Anthoptilum grandiflorum	Sea Pen	Octocorals	1
Funiculina sp.	Sea Pen	Octocorals	24
Pennatulacea	Sea Pen or Whip	Octocorals	33

Umbellula magniflora	Sea Pen	Octocorals	3
Grand Total			**68**

Groundfish Component

The NWFSC occurrence models predict that Area 13 contains high probability habitat for 2 species: sablefish and longspine thornyhead (Table 5). High probability habitat for abundant focal species (sablefish and longspine thornyhead) was selected as the probability of occurrence $\geq$0.50 (based on cutoffs in EFH Synthesis Report p.42). Observations by MBARI (Table 30) corroborate NWFSC occurrence models in this area.

Table 30: Area 13: MBARI groundfish observations (VARS data query by Linda Kuhnz 7/18/13).

		Area 13
Scientific Name	**Common Name**	**Between Partington Point and Lopez Point**
Anoplopoma fimbria	Sablefish	2
Sebastolobus	Longspine and Shortspine Thornyhead guild	126
Grand Total		**128**

5b. Spatial and Geological Characteristics

This proposed area adds 74.25 sq st miles to the southern boundary of the Big Sur Coast Port San Conservation Area (Table 1). It is also contiguous to the Big Creek State Marine Reserve and State Marine Conservation Area. The area includes portions of Partington and Lucia Canyon systems and is 100% soft bottom habitat on the shelf between 473m and 1210 m. Relatively low habitat diversity (index=3.28). This area is also a sub set area of SESA 14, which was identified by the Sanctuary as a location of unique, rare, or important habitat.

5e. Socioeconomic Characteristics

This area has very little past or current trawling activity, and therefore did not infringe or impact any current local fishing activities to our knowledge

Lack of agreement on Areas 14 & 15

The group submitting this proposal did not reach agreement on Areas 14 & 15. As a result, the Sanctuary decided to submit these two areas on behalf of the fishing industry and the Sanctuary. Three of the conservation organizations (Oceana, NRDC and Ocean Conservancy) will be submitting an alternative proposal for the region south of 36 degrees North latitude. This is due to the fact that EFH discussions for the region of the sanctuary south of 36 deg. N took place separately from the larger group of collaborating organizations listed on this proposal.

AREA 14 – ADD A NEW CONSERVATION AREA – "LA CRUZ CANYON"
(also add as a New HAPC Area of Interest)

	
Rosy rockfish (*Sebastes rosaceus*)	Phylum *Porifera* and Class *Crinoidea*

5a. Biological Characteristics

Biogenic Components

Groundfish survey trawls in shelf and shelf break habitat have captured corals immediately outside this proposed area. CSUMB surveys to characterize benthic habitats and communities (using camera sled and ROVs) have occurred at multiple locations in shelf and shelf break habitats and have observed 3 sea pen/sea whip and 334 sponges at this site.

Table 31: Area 14: CSUMB Observed Invertebrates (2007-2012).

La Cruz Canyon Area	Common Name	Group	Count
Pennatulacea	Sea Pen or Whip	Octocorals	3
Porifera	Sponge (>10 cm)	Sponge (>10 cm)	366
Grand Total			**369**

Groundfish Components

The NWFSC occurrence models predict that Area 14 contains high probability habitat for 4 species: sablefish, petrale sole, darkblotched rockfish and greenstriped rockfish (Table 5). High probability habitat for abundant focal species (sablefish and petrale sole) was selected as the probability of occurrence $\geq$0.50 and high quality for less abundant focal species (darkblotched rockfish and greenstriped rockfish) was identified as the probability of occurrence $\geq$0.25 (based on cutoffs in EFH Synthesis Report p.42).

Table 32: Area 14: CSUMB Groundfish Observations (2007-2012).

		Area 14
Scientific Name	**Common Name**	**La Cruz Canyon Area**
Canary/Vermilion/Yelloweye complex	Canary/Vermilion/Yelloweye complex	70
Sebastes elongatus	Greenstriped Rockfish	3
Sebastes ruberrimus	Yelloweye Rockfish	1
Ophiodon elongatus	Lingcod	23
Sebastes paucispinis	Boccacio	3

Young of Year (YOY)	Rockfish <5cm (scholO	488
Grand Total		**588**

5b. Spatial and Geological Characteristics

This area is proposed as a new HAPC area of interest as well as a new EFH Conservation Area, and is located just north of Piedras Blancas SMCA and SMR. It overlaps the RCA and is located at the head of La Cruz Canyon. The area would add 8.89 sq st miles to EFH and is located on the shelf in a relatively shallow depth range (95-354 m). The area contains a geologic feature of mainly hard substrate (83.2%); 7.40 sq st miles represent a rocky reef HAPC that sits on the outer shelf and shelf break. This area has the second highest habitat richness (10 habitats) and habitat diversity (index = 4.40). This area is also included into SESA #15, which was identified by the Sanctuary as a location of unique, rare, or important habitat.

5e. Socioeconomic Data

Fishermen associated with the California Risk Pool prepare and adopt their own "Fishing Plans" and enforced related fishing rules that were intended to reduce the risk of an unintentional harvest of OFS. The goals of each Fishing Plan are to promote the long-term success of the fishery and its supporting port communities, by:

- maximizing the harvest of target species from the fishery;
- minimizing the take of OFS from the fishery,
- safeguarding sensitive fish habitat off the Pacific Coast; and
- contributing to the rebuilding of OFS stocks.

The Industry in the Morro Bay area have provided input that Area 14 has a high likelihood of catching an unacceptable amount of overfished rockfish species, it consists of sensitive habitat that is worthy of being protected, and with this design there will still be fishing opportunity shoreward and seaward of the hard bottom.

The Sanctuary and fishing industry also designated a larger, "voluntary management area" that was selected based on the observations sea pens, sea whips and sponges in this area (CSUMB data).

AREA 15 – ADD A NEW CONSERVATION AREA – "EXTENSION OF PIEDRAS BLANCAS STATE MARINE CONSERVATION AREA"

	
Large sponge (Phylum *Porifera*)	Class *Crinoidea*

5a. Biological Characteristics

Biogenic Components

The West Coast Groundfish Bottom Trawl Survey has identified one sea whip from a 2007 survey.

Table 33: Area 9: Observed Pennatulids (DSCRPT database).

West of Piedras Blancas SMCA	Common Name	Group	Count
Pennatulacea	Sea Pen or Whip	Octocorals	1

Groundfish Components

The NWFSC occurrence models predict that Area 15 contains high probability habitat for 4 species: sablefish, petrale sole, darkblotched rockfish and greenstriped rockfish (Table 5). In addition, 61 observations of groundfish were documented in this area. CSUMB has spent a fair amount of effort in this area (Appendix A, Area 15) and observed a many rockfish (Table 34) although there is no known hard bottom mapped in this area.

Table 34: Area 15: CSUMB Groundfish Observations (2007-2012).

		Area 15
Scientific Name	**Common Name**	*West of Piedras Blancas SMCA*
Canary/Vermilion/Yelloweye complex	Canary/Vermilion/Yelloweye complex	61
Ophiodon elongatus	Lingcod	1
Sebastes paucispinis	Boccacio	1
Young of Year (YOY)	Rockfish <5cm (usually in a school)	67
Grand Total		**130**

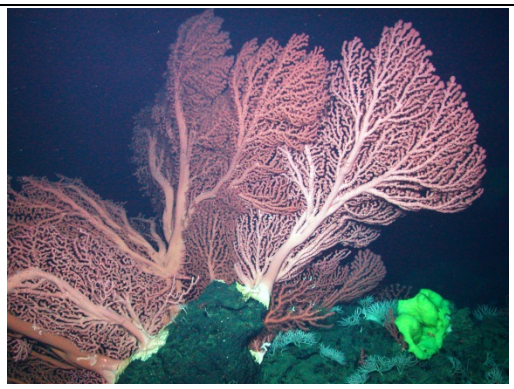
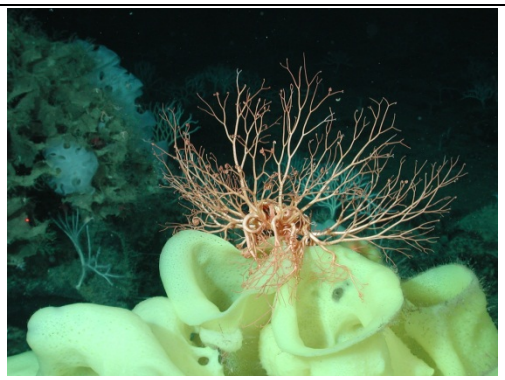
5b. Spatial and Geological Characteristics

This area is proposed as a new EFH Conservation Area and is located contiguously to the Piedras Blancas SMCA, in fact it was designed as an extension to the SMCA. This area has not been officially surveyed for substrate and yet is identified as "rocky" on the NOAA chart. Numerous fishermen have noted this is a rocky area to be avoided. The area would add 2.95 sq st miles to EFH Conservation Areas and is located on the shelf in a relatively shallow depth range (72-119 m). This area has low habitat richness (2 habitats) and habitat diversity (index = 1.49). The northern end of this area is included in SESA 14, which was identified by the Sanctuary as a location of unique, rare, or important habitat.

5e. Socioeconomic Characteristics

Please see Area 14 discussion as it applies to this area as well. We also discussed that placing a federally protected area next to a state area will promote cross agency collaboration on studies.

DAVIDSON SEAMOUNT CONSERVATION AREA – NO CHANGES

	
Bubblegum coral (*Paragorgia arborea*) Photo: MBARI/NOAA	Basket star atop the sponge from the Genus *Staurocalyptus.* Photo: MBARI/NOAA

The proposal requests no changes to the boundaries of the Davidson Seamount Conservation Area, which prohibits all bottom contact gear, or any other gear that is deployed deeper than 500 fathoms in the Davidson Seamount Management Zone of the MBNMS. There are a total of 20,541 invertebrate observations from the DSCRTP database within the Davidson Seamount Management Zone: 104 pennatulids and 20,437 corals.

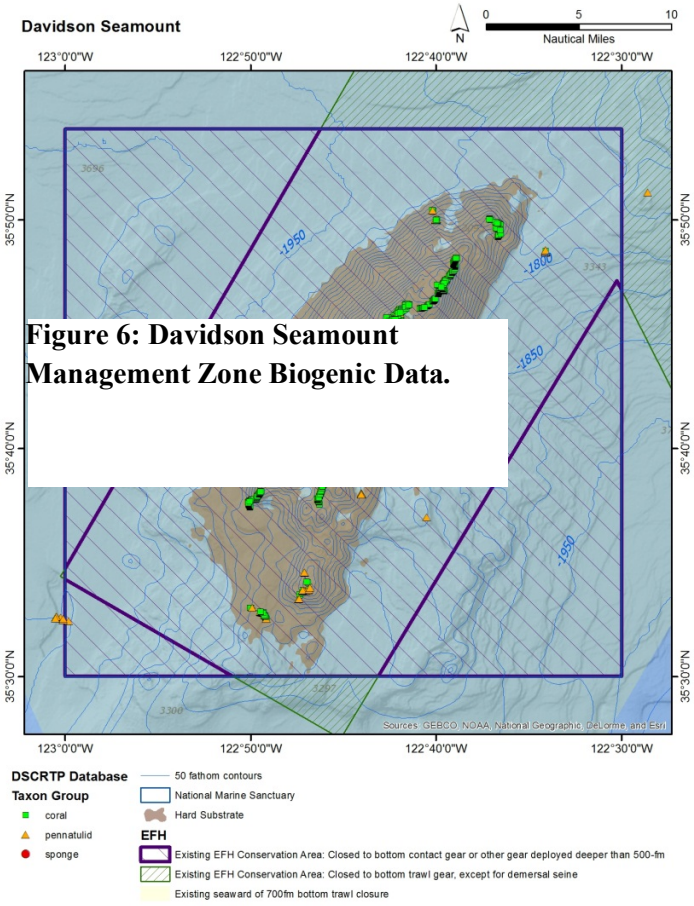


Figure 6: Davidson Seamount Management Zone Biogenic Data.

6. DISCUSSION

In 2006, EFH and the related regulations went into effect, resulting in 2,661 square statute miles of MBNMS being closed to trawl gear, through a combination of EFH Bottom Trawl Conservation Areas and the 700 Fathom Trawl Footprint Closure. In 2009, EFH was amended for Davidson Seamount Management Zone to include restrictions for bottom contact gear. For the trawl fleet, the 2006 EFH regulations closed approximately 68% of the area within the Sanctuary to bottom trawling. MBNMS staff, while mostly satisfied with the 2006 EFH footprint in the sanctuary felt that the groundfish EFH 5-yr review was an opportunity for refining boundaries based on: 1) increased protection for sensitive benthic habitats not included within current EFH Bottom Trawl Conservation Areas; 2) new information on the presence and location of biogenic habitat and groundfish that had not been available during the 2006 EFH process; 3) maintaining a sustainable local groundfish fishery; and 4) community need for a broadly collaborative process in this region. Through careful analysis of data and other information, MBNMS facilitated an agreement that resulted in an additional proposed 168.5 sq st miles of added EFH Conservation Areas and a proposed 99.1 sq st miles of re-opened trawl grounds in currently closed areas to improve trawl fishing opportunities.

In developing this proposal, one of the main objectives was to determine if there are areas in the sanctuary that contain habitats important to groundfish FMP stocks that are vulnerable to bottom trawling. We analyzed available data on rocky habitat, soft bottom (e.g., unconsolidated sediments), and biogenic habitat in the sanctuary, but focused most of our attention on determining the location and presence of hard bottom, corals, and sponges because these habitats are importance to groundfish, very sensitive to impacts from bottom trawling, and are slow to recover from impacts. Soft-bottom habitats are also important to groundfish FMP species and our proposal seeks to increase the overall area of this habitat type in EFH Bottom Trawl Conservation Areas. However, given the high abundance of this habitat and its lower sensitivity, combined with the relatively high value of some currently closed soft bottom areas to the trawl industry, this habitat was the focus of strategic trade-offs between proposed new additions and re-openings.

HABITATS

The following sections briefly discuss the data and information provided in the EFH Phase 1 Report, the EFH Synthesis Report, as well as the EFH-FEIS and Amendment 19, and how that information was used to devise the proposed modifications to EFH in MBNMS. In addition, it summarizes site specific data (when available) to further understand the presence and location of habitats important to groundfish FMP stocks, the relative vulnerability of habitats to impacts from bottom trawling, and socioeconomic information on the location of high value areas to re-open for the local trawl fishery.

Rocky Habitat

As defined in the Groundfish FMP, rocky habitat may be composed of bedrock, boulders, or smaller rocks, such as cobble and gravel. Rocky habitats are one of the least abundant benthic habitats, especially in deeper waters. A first approximation of its extent is provided by the substrate data in the groundfish EFH assessment GIS. According to the EFH Synthesis Report, hard and mixed substrates appear to be

relatively rare (7.2% and 3.3%, respectively) when compared coast-wide to soft substrate (89.5%). Based on the substrate data layers in the EFH Phase 1 Report, 6.8% of the seafloor in the MBNMS study region is rocky habitat (Table 7).

It should be noted that the majority of the federal waters within MBNMS study area has not been surveyed for fine-scale substrate information (e.g., by sidescan sonar, multibeam or visual observation) so most habitats are unknown and are therefore shown as soft sediment. However, through direct observation, it has been possible to further distinguish between hard and soft substrate in a few areas in the sanctuary. For example, we have visual data that confirms that hard substrate is under-represented on the Point Sur Platform (Area 12) and there is some information that hard substrate is present in Area 15. We have been working to increase our information on benthic habitat through visual surveys in some of these areas (e.g., 1, 2, 12, 14, 15) and we will continue to do so (hopefully in some of the re-open areas) as funding allows. However, for the purpose of this proposal, we had to use the best available to data to identify the location of hard bottom habitat

As noted in the Groundfish EFH-FEIS, hard substrates are one of the least abundant benthic habitats, yet they are among the most important habitats for groundfish. Many managed species are dependent on offshore hard bottom habitat during some portion of their life cycle. Typically, deeper water hard bottom habitats are inhabited by large, mobile, nektobenthic fishes such as rockfish, sablefish, Pacific hake, spotted ratfish, and spiny dogfish (MMS 2002). Cross and Allen (1993) estimated that about 30% of the fish species and 40% of the families occur over hard substrates. The Groundfish EFH-FEIS notes 56 managed groundfish species that use hard bottom habitats during one or more life stages.

In addition to its importance as groundfish habitat, rocky habitat is thought to be sensitive to, and slow to recover from, impacts from bottom trawling. Impacts of bottom trawling include the possible alteration of physical formations such as boulders and rocky reef formations and the removal of associated biogenic species (e.g., corals, and sponges) that may provide structure for prey species (PFMC 2011a). As noted in the EFH Phase 1 Report, hard gravel/pebble/cobble pavements, ridges, boulder fields, and pinnacles are generally considered to be static habitats that only typically vary as a result of punctuated, high energy events (e.g., geologic activity, tsunamis). Recovery after disturbance may be long-term (years to decades), and in some cases the alteration to the physical structure may be permanent.

Given its relative importance to groundfish, rarity, and sensitivity to impacts, rocky habitat has been designated as a HAPC for Pacific Coast Groundfish. In MBNMS, currently 37.1 sq st miles of rocky reef HAPC is outside of current trawling prohibitions (EFH Bottom Trawl Conservation Areas, EFH 700 fm bottom trawl footprint closure, and Trawl Rockfish Conservation Area) and therefore, vulnerable to impacts from this activity. This proposal will add 27.3 sq st miles of this vulnerable rocky reef HAPC to EFH Bottom Trawl Conservation Areas (Table 2).

Biogenic Habitat

As discussed in the EFH-FEIS, biogenic species, including corals, anemones, sponges, sea pens, and sea whips, grow up from the ocean floor and increase the complexity of the benthic environment, a possibly unique ecological function. There is little data to support conclusions about the role of these organisms on the West Coast; however, studies from other areas of the world demonstrate that corals in particular

support complex ecological communities and increased biodiversity in comparison with areas without corals. The role or corals, sponges, sea pens, and sea whips in the lives of groundfish have not been clearly demonstrated. Several groundfish FMP species, including arrowtooth flounder, big skate, California skate, Dover sole, lingcod, longspine and shortspine thornyhead, sablefish, spotted ratfish, and a variety of rockfish, have been observed in association with these benthic organisms. A recent study off the eastern coast of Canada observed rockfish larvae (*Sebastes* spp.) in close association with five species of sea pen, which may act as nursery habitat providing shelter to larval fish (Baillon et al. 2012). However, additional study is required to draw definitive conclusions.

As discussed in the EHF Phase 1 report, empirical research indicates that biogenic habitat is the habitat type most adversely impacted by fishing gear. Impacts of bottom trawling to physical and biogenic habitats include removal of corals and sponges that may provide structure for prey species and possible alteration of physical formations, such as boulders and rocky reef, on which these species attach (PFMC 2011a). Corals, anemones, sponges, sea pens, and sea whips are a highly sensitive habitat that may be substantially modified with relatively little fishing effort (NRC 2002). Hyland et al. (2005) observed a site in the OCNMS containing patches of stony coral with large proportions consisting of dead and broken skeletal remains and broken gorgonian coral. There was also evidence of bottom trawling and derelict fishing gear within the same study site. It may be that initial contact (i.e., the first time gear is deployed) is the most important due to the high sensitivity of the habitat to impact. Highly sensitive habitat may be most impacted by initial contact with fishing gear

As discussed in the groundfish EFH-FEIS, there have not been many studies of how these organisms recover from initial impact. However, growth rates of corals in particular suggest that recovery is in excess of seven years and likely to be much longer (Roberts and Hirshfield 2004). Kaiser et al. (2006) found that slow-growing large-biomass biota such as sponges and soft corals took much longer to recover (up to 8 years) than biota with shorter-life spans such as polychaetes (< 1 yr). Fujioka (2006) recommended using longer estimates of recovery time for hard corals, on the order of 100 years, and developed a Long-term Effect Index (LEI), which calculated an estimate of the proportion of each habitat type in each cell impacted over the long-term under current levels of effort. The LEI results for hard corals were typically greater than 50 percent even under low levels of trawl effort. Also noteworthy is that in 2010, NOAA released a Strategic Plan for Deep-Sea Coral and Sponge Ecosystems that noted habitats where deep-sea corals or sponges occur have been identified as EFH for a number of fisheries. Additionally, the Plan states that NOAA takes a precautionary approach to manage bottom-tending gear, especially mobile bottom-tending gear, and other adverse impacts of fishing on deep-sea coral and sponge ecosystems. One of the tools identified is the use of EFH management measures.

Information on the presence and location of coral and sponge on the west coast has been greatly improved since the earlier EFH 2005 process, through the DSCRTP database and associated maps and tables, provided in the EFH Phase 1 and Synthesis Reports. One of the conclusions in the NMFS Synthesis Report is that current EFH Conservation Areas protect some deep-sea coral, sponge, and pennatulid habitat, but a substantial amount of this habitat remains outside EHF Conservation Areas. Out of the over 4,100 grid cells with coral/sponge presence, 71% remain outside EFH conservations areas, and 16.7% of

those occur in the central sub-region. For grid cells with pennatulid presence, 73% are outside EFH conservation areas, and 35.7% of those occur in the central sub-region.

The synthesis report also noted that there are numerous sites outside EFH conservations areas where corals and sponges have been observed in higher relative numbers, include portions of Monterey Bay and near the shoreward boundary of the Big Sur Coast/Port San Luis area. Mapping of coral, sponge, and pennatulid observations from the DSCRTP database in the MBNMS study area confirmed that 46% of the observations - 4071 corals, 5032 sponges, and 23,588 pennatulids, were outside current EFH CA boundaries [Table 3]. The report also noted that large areas have not been surveyed so we supplemented the biogenic data provided using direct observations from camera sled and ROV surveys in MBNMS when available. In doing so, we identified many additional observations of corals and sponges outside EFH Conservations Areas (see CSUMB coral and sponge data displayed in Figure 3).

The proposed actions would result in increased protection of highly sensitive biogenic habitat that is vulnerable to bottom trawling. Based on the observations in the DSCRTP data, the proposed additions the EFH Bottom Trawl Conservation Areas would include 1292 coral, 3854 sponge, and 1443 pennatulid observations (Table 2). Data from additional visual surveys by CSUMB in Areas 2, 12, and 14 indicates that the addition of these areas to groundfish EFH Bottom Trawl Conservation Areas would protect an additional 636 sponge and 160 pennatulid observations from potential impacts from bottom trawling. (Table 4)The Magnuson-Stevens Fishery Conservation and Management Act (MSA) allows NOAA to manage fishing-related threats to deep-sea corals and sponges in federal waters through fishery management plans developed in conjunction with the Regional Fishery Management Councils. The MSA was amended in 2007, requiring NOAA to establish the Deep Sea Coral Research and Technology Program and providing new discretionary authority to protect deep-sea coral and sponge areas from damage caused by fishing gear. Given the potential importance of this habitat based on studies from other areas and the high sensitivity of this habitat to impacts from bottom trawling, a precautionary approach to minimize vulnerability of deep sea coral and sponge to bottom trawling is supported by this proposal.

Soft-bottom Habitat

As defined in the Groundfish FMP, offshore, unconsolidated bottom habitats are composed of small particles (i.e., gravel, sand, mud, silt, and various mixtures of these particles) and contain little to no vegetative growth due to the lack of stable surfaces for attachment. Soft bottom habitats are the most abundant benthic habitats, especially in deeper waters. A first approximation of its extent is provided by the substrate data in the groundfish EFH assessment GIS. According to the EFH Synthesis Report, soft bottom is relatively abundant (89.5%) coast-wide when compared to rocky and mixed habitat (7.2% and 3.3%, respectively). Based on the substrate data layers in the EFH Phase 1 Report, 93.2% of the seafloor in the MBNMS study region is soft bottom (Figure 4, Table 7).

Fish species commonly occurring over soft bottom benthos include skates and rays, smelts, surfperches, and flatfishes; however, other species may predominate in certain areas (e.g., white croaker, hagfish, and ratfish (MMS 2002)). In the Southern California Bight, about 40% of the fish species and 50% of the families occur in soft-bottom areas of the open coast (Cross and Allen 1993). A large number of managed groundfish species utilize offshore unconsolidated bottom habitat during at least part of their life cycle

including arrowtooth flounder, big skate, butter sole, California skate, curlfin sole, Dover sole, English sole, flathead sole, leopard shark, lingcod, longnose skate, longspine and shortspine thornyhead, Pacific cod, Pacific rattail (grenadier), Pacific sanddab, petrale sole, rex sole, rock sole, sablefish, sand sole, soupfin shark, spiny dogfish, spotted ratfish, starry flounder, and 28 species of rockfish.

As discussed in the EHF Phase 1 report, empirical research indicates that soft bottom habitat is the habitat type least adversely impacted by bottom trawling, as compared to biogenic habitat and rocky habitat. Some recent studies, including those performed on the U.S. West Coast, found impacts of trawling on soft sediment habitats to include:

- Alteration of the physical structure of the seafloor, such as decreases in the amount of biogenic mounds, depressions, and flocculent material and/or increases in the amount of trawl tracks and exposed sediment (Engel and Kvitek 1998, de Marignac et al. 2008, Lindholm et al. 2012);
- Lower densities of demersal fish and epibenthic macro-invertebrate communities (Engel and Kvitek 1998, Hixon and Tissot 2007; de Marignac et al. 2008; Hannah et al. 2010);
- Enhanced abundance of smaller-bodied fauna, opportunistic species, and certain prey important in the diet of some commercially important fishes such as flatfishes (Engel and Kvitek 1998, Kaiser et al. 2006);
- Lindholm et al. (2008) studied patterns in the distribution of the sea whip in an area impacted by mobile fishing gear off the central California coast and found that the marked difference in the occurrence of upright sea whips among video transects may be attributable to water depth and/or impacts from otter trawling.

In a recent study of trawling impacts and recovery of soft bottom habitat at a depth of approximately 170 m off central California (Morro Bay area), Lindholm and colleagues (2012) found little to no detectable impact of trawling on the physical topography and biological community, except for persistent scour marks from trawling gear. In addition, the invertebrate assemblage in the study area was found to be highly variable in both space and time, suggesting that aspects of this habitat can be dynamic, making it difficult to understand and predict the impacts of trawling on the benthic community. Several of these publications on the impacts of bottom trawling on soft bottom habitat have noted that little has been written about recovery of seafloor habitat from the effects of fishing and that there is a lack of long-term studies, control sites, or research areas, which hinder the ability to fully evaluate impacts.

Given the importance of soft bottom habitat to many groundfish FMP species and the occurrence of biogenic species – sea pens and sea whips - that can be negatively impacted by trawling, this proposal aims to increase the total amount soft bottom habitats in MBNMS that is protected from bottom trawling by identifying 141.2 sq st miles for inclusion in EFH Bottom Trawl Conservation Areas. In addition, based on the apparent lower sensitivity of this habitat to significant long-term negative impacts from bottom trawling and the importance of soft-bottom habitat to the economic viability of the local groundfish trawl fishery, this proposal also identifies 98.8 sq st miles to re-open to groundfish bottom

trawl fishery. The net outcome of the proposal is a net increase in the amount of soft bottom habitat in EFH Bottom Trawl Conservation Areas of 42.4 sq st miles (Table 2).

Submarine Canyon

As discussed in Amendment 19 to the groundfish FMP (pg 69), canyons are complex habitats that may provide a variety of ecological functions. Shelf-edge canyons have enhanced biomass due to onshore transport and high concentrations of zooplankton, a principal food source of juvenile and adult rockfish (Brodeur 2001). Canyons may have hard and soft substrate and are high relief areas that can provide refuge for fish, and localized populations of groundfish may take advantage of the protection afforded by canyons and the structure-forming invertebrate megafauna that grow there (Monterey Bay National Marine Sanctuary 2005). A canyon in the North Pacific was observed to have dense aggregations of rockfish associated with sea whips (*Halipteris willemoesi*), while damaged sea whip "forests" had far fewer rockfish (Brodeur 2001). During surveys in the headward part of Soquel Canyon, Yoklavich and colleagues (2000) observed a high abundance of adult rockfishes in association with rock habitats along the sides of Soquel Canyon, suggesting that this canyon may serve as a natural harvest refuge for economically valuable rockfishes.

This proposal aims to increase the amount of canyon habitats in MBNMS that is protected from bottom trawling. We have identified 44.5 sq st miles for inclusion in EFH Conservation Areas, 20% of which is hard bottom canyon habitat (Table 35). We have identified 24.2 sq st miles of canyon habitat to re-open for the groundfish bottom trawl fishery, comprised almost entirely of soft bottom canyon habitat (0.3 sq st miles of hard bottom canyon habitat). The net outcome of the proposal is a net increase in the amount of canyon habitat in EFH Bottom Trawl Conservation Areas of 20.3 sq st miles (Table 35).

Table 35: EFH Proposed Boundary Modifications: Summary Statistics.

		Area (sq st mi)		Habitat Percentage		Area (sq st mi) by Caynon/Non-canyon	
EFH Modification	**Area (sq st mi)**	**hard bottom**	**soft bottom**	**hard bottom**	**soft bottom**	**Canyon**	**Non-canyon**
add to EFH	168.51	27.34	141.17	16.2%	83.8%	44.5	124.0
reopen EFH	99.14	0.36	98.78	0.4%	99.6%	24.2	74.9
Net add to EFH	**69.37**	**26.98**	**42.39**	**39.1%**	**60.9%**	**20.3**	**49.1**

Juvenile Habitat

As discussed in the synthesis report, quantity or quality of juvenile habitat can play a critical role in the population dynamics of many groundfish FMP species. However, there is a general lack of habitat

information for most juvenile groundfishes. In a recent study in MBNMS to estimate the relative abundance of habitats on the shelf (65-110 m) and to examine demersal fish species composition, diversity, density, and sizes relative to these habitats, Laidig and colleagues (2009) noted that the abundance of immature fishes in the study area may indicate that this area of the shelf is a nursery for younger fishes. This area on the continental shelf at intermediate depth may be an ontogenetic transition zone for immature fishes - a staging area between the shallow, nearshore young-of-the-year habitats and deeper, adult habitats**.**

Three of the areas proposed for addition to EFH Bottom Trawl Conservation Areas - Areas 2, 12, and 15 - overlap substantially with this intermediate depth zone (30-100 m) that may serve as juvenile habitat for some groundfish FMP species. Area 2 overlaps substantially with the area studied by Laidig and colleagues in 2009. Though Areas 12 and 15 have not received the same level of sampling effort or data analysis as Area 2, there are observations of juvenile groundfish in both areas (see Groundfish Components summaries for each area in Section 5a). In particular, visual surveys in Area 12 by CSUMB between 2007and 2012 have recorded 3,047 observations of young-of-the-year (YOY) rockfishes (<5 cm, usually in schools).

As noted in the 2009 study, a generalized understanding of the importance of this intermediate depth zone is hampered by the relatively few habitat surveys focused on the intermediate depths (30–100 m) of the continental shelf off the west coast of the United States. In addition, Laidig et al. (2009) note that historical fishing pressure in the study area may have contributed to the lack of large, mature fishes. Inclusion of Areas 2, 12, and 15 to EFH Bottom Trawl Conservation Areas, would lend protection to this potentially important juvenile habitat and would allow for research on the potential nursery role of these areas to occur without the confounding effects of trawling impacts.

ADDITIONAL MANAGEMENT OPTIONS

Voluntary Management Areas

During the stakeholder meetings, the full group identified two areas that had concerns from conservation representatives as areas that have observed biogenic habitat, and could be adversely affected by trawling. The fishermen agreed that if the coordinates could be provided, they would as a precautionary approach voluntarily avoid these areas for a specified time period (exact time TBD). In addition, the Sanctuary and fishing industry stakeholders identified an additional Voluntary Management Area in the vicinity of Area 14 and 15. The group will develop a process that includes further investigation of the areas, evaluation of the effectiveness of this experimental, pilot concept, how to set agreed upon time limits for continued close or reopen scenarios, and a timeline for this process development. Putting the areas into "voluntary management" status now, will alleviate the fishermen's concern about adding small areas that may put them in a challenging position if closed through regulation, and will provide a test of this new, experimental concept for habitat protection. Following is a brief description of each area:

- **South of Area 2 by Davenport:** South of Area 2 is a small "voluntary management area" that was selected based on a small outcropping of rocky reef and hundreds of observations of

pennatulids in this area from MBARI ROV dating back to 1993. This area is not officially included in the proposal, yet based on the density of pennatulids on a rocky reef, there is agreement by the fishermen to observe this as a no trawl zone.

- **South of Area 12 close to the Pt Sur Platform:** Connected to and south of the Pt Sur Platform area the group agreed upon a small "voluntary management area" that extends the southeast boundary (between the Area 12 and RCA) and was selected to include a small extension of rocky reef based at the head of Pt Sur Canyon. This rocky reef HAPC had a number of observations of structure forming inverts in this area, and so there is agreement by the fishermen to observe this as a no trawl zone.
- **Around Area 14 at La Cruz Canyon (not proposed through consensus):** Lastly, the fishermen and Sanctuary designated a larger, "voluntary management area" that was selected based on the observations of sea pens, sea whips and sponges in this area (CSUMB 2007-2012 data). This area is not included in this EFH proposal as an addition, yet based on the numbers of biogenic inverts on the rocky reef, there is agreement by the fishermen to observe this as a no trawl zone.

Changes to Enforcement of Spatial Areas

Key sensitive Essential Fish Habitat types for groundfish are in many cases located in close proximity to high value areas to the groundfish fishery. Therefore, efforts to "minimize to the extent practicable adverse effects to EFH by fishing" are largely dependent on the ability to develop highly tailored and enforceable spatial boundaries for open and closed areas to bottom trawling at a high/fine level of spatial resolution. The current enforcement of spatial bottom trawl closures (RCAs, EFH, etc) uses Vessel Monitoring Systems with a ping rate of approximately one hour. At this ping rate with a trawl speed of 2 to 3 knots, effective VMS enforcement will require the size of the trawl closure to approach 3-4 miles in diameter. While VMS as currently configured with the one hour ping rate is appropriate for large-scale closures where there is less concern about fishing near the boundaries, it is insufficient for enforcement of fine-scale closures and boundaries.

The problems include an inability to know the precise trawl path and difficulty discerning whether fishing is actively taking place. The relevant consideration for EFH enforcement is whether the trawl net is in contact with the seafloor. As a result, bottom trawl fishermen have uncertainty about whether they may be committing a violation when they are fishing in close proximity to closed areas, if they drift into a closed area while retrieving their net, or if they drift into a closed area as a result of hanging their gear on a snag or loss of engine power. Conversely, enforcement officials have uncertainty about where exactly fishermen are fishing, whether they are intentionally fishing inside closed areas, and when active fishing is taking place. The practical effect of implementing small closures is that it is difficult to design small scale closures that allow fishing in proximity to sensitive EFH areas. As a result, closed area boundaries around habitat features must be much larger than the boundaries of the feature itself to ensure protection, at the potential expense of closing valuable fishing grounds where impacts would be minimal.

Proposed solution: We propose that as part of the revised EFH regulations, a new enforcement regime is implemented to include:

- Changing the VMS ping rates from 1 hour to 15 minute intervals to more precisely indicate the location of the vessel track while fishing is occur
- Requiring the use of hydraulic sensors to determine precisely when trawl nets are retrieved and deployed.
- Requiring depth sensors to record the active fishing depth of the trawl net in relation to the seafloor.
- Requiring the recording and reporting of these sensory data by means of an electronic log book.

These changes will allow fishermen to fish in close proximity to the boundaries of closed areas without fear of being accused of fishing in a restricted area and enforcement will have confidence that fishermen are in compliance, hence removing all ambiguity. In other words, there will be no need for "buffers" around habitat features to ensure their protection and lines can be drawn tightly to encompass actual trawl tow track lines to ensure precautionary habitat protection.

The electronic logbook (E log) may be the most important and appropriate tool, potentially avoiding the need to increase VMS ping rates, though these tools may also be used in concert. As envisioned, development of a west coast E log would follow the same strategy as the development of the west coast electronic fish ticket (E ticket). The E log would emulate the numerous state (paper based) log books through a series of drop down fields. Data collection would be done through sensors and vessel operator inputs. Sensors on the hydraulics and net drum(s) would lay down a lat/long and time/date stamp recording on a laptop located in the wheel house. Depth sensors would record the "fishing" depth of the net in relation to the sea floor. The vessel operator would input species tow data on a per tow basis. The data package could be uploaded through the vessel VMS system for real time reporting, or alternatively could be sent as an email attachment once in range of a cell tower while the vessel is returning to port or within 24 hours of off load (same reporting requirement at E Tickets).

Once the data has been received, state, PSMFC, and Federal fishery managers and scientist would use the data consistent with current practices, but in a much more timely fashion and with much more confidence in the data itself.

In summary, these measures will allow more targeted and refined management of EFH, better achieving the dual objectives of minimizing adverse impacts to habitat while maintaining vibrant fisheries. These measures will provide greater security to fishermen and confidence in their compliance. These changes are consistent and enabled by the current move towards Electronic Monitoring of west coast fisheries, including catch shares. Therefore, the additional costs of implementation in the context of spatial management should be lower.

Future Benthic Research and Monitoring Plan

The group recommends the National Marine Sanctuary Program develop and fund a monitoring plan for the MBNMS HAPC/EFH Conservation Area to ensure that site objectives are met over the long-term. We also discussed the possibility of working together on a future opportunity to obtain a collaborative

fisheries grant. Some ideas for research foci include looking at changes over time in areas to be reopened to bottom trawling with the purpose of detecting and monitoring the extent of impacts once trawling resumes.

In addition, MBNMS is formulating a research and monitoring plan to collect visual data in many of the proposed areas. Some of research and monitoring will occur as an extension of on-going studies. For example, the collaborative research partnership between MBNMS and CSUMB IfAME lab just completed ROV benthic surveys in portions of Areas 1, 2 and 12. MBARI has expressed interest in doing ROV surveys to help collect data in SESAs. MBNMS and the collaborating conservation organizations on this proposal are interested seeking funding for studies to monitor changes over time in areas reopened to bottom trawling with the purpose of detecting and monitoring the extent of impacts when trawling resumes.

II. CONTRIBUTORS

The following individuals were authors on this document, contributed meeting support, data analysis, maps, charts, and/or summaries presented in this proposal.

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